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ORIGINAL COMMUNICATIONS.

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THE RESULTS OBTAINED FROM THE RADICAL OPERATION FOR CHRONIC PURULENT OTITIS MEDIA.*

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Owing to the frequency of chronic middle ear suppuration, and the fatal results which so often follow this condition, if it is left uncontrolled, it is no wonder that the radical operation for the cure of chronic middle ear suppuration has been greatly exploited during the past decade. The true value of any surgical procedure can only be determined after the operation in question has been in vogue for a number of years, thus giving an opportunity for the ultimate results following operative interference to be definitely decided upon.

The results obtained by the operation in question, may be considered under the following heads: 1st, the efficiency of the operation in protecting the patient against intra-cranial suppuration; 2nd, efficiency of the operation in causing a permanent cessation of the otorrhea; 3rd, the immediate and remote effect of the operation upon the function of the organ, and 4th, the effect upon the integrity of the facial nerve.

I have upon my books at the present time records of 193 operations of this character. In none of these patients, so far as I know, has there been any evidence of an intra-cranial lesion after the suppuration has been relieved. We may say, therefore, that the radical operation certainly does protect the patient from the dangerous

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sequelae of middle ear suppuration. When we come to consider the matter of the permanent relief of the otorrhea, the results obtained by this procedure are, perhaps, not as flattering as we had hoped they would be when the procedure was first suggested.

Out of 193 cases, there are 131 cures, 29 with slight discharge, 5 with profuse discharge, 2 still under treatment, 6 fatal cases, and 20 cases in which the result is unknown. In going over these results more in detail, if we take out the 20 cases, in which the result is unknown, we have 173 cases, of which 131 are cured, or a little over 75%. Out of the last series of 95 cases, the cures amount to exactly 80%, in those cases in which the results are complete. In the last series of cases, in no instance did the discharge remain profuse after the operation, all of the cases being either dry or presenting but a slight discharge from the meatus. Of the 6 deaths, two patients died of pneumonia, two of meningitis, one of cerebral abscess and one of cerebellar abscess, complicated by sarcoma of the auditory nerve. In no instance, could death be attributed either directly or indirectly to the operation.

Of those cases which were operated upon several years ago, and which have been followed carefully, the results have been most satisfactory. Even where a small amount of discharge has persisted for weeks or even months after the operation, this discharge has in almost every instance, disappeared absolutely, without the necessity of secondary interference, under simple measures of cleanliness.

Even in those cases where the cure has been considered perfect, it is not uncommon to have the patients return, at intervals of from three to four months to one or two years, complaining of some discharge from the external auditory canal. An examination will show the entire cavity filled with a mass of desquamated epithelium, upon the removal of which a small amount of pus may be found. If this accumulation has remained in the canal for a considerable period of time, desquamation of the epithelial lining of the cavity may have taken place, either completely or over certain areas. On removing the epithelial mass, the cavity certainly looks far from healthy, and one unaccustomed to this condition, would certainly say that the radical operation had been a failure. If the cavity is simply sterilized with an alcoholic solution of bichloride of mercury, and then dusted with some bland non-irritating powder, such as boric acid, xeroform, zinc oxide, or, in fact, any sterile powder, the cavity immediately becomes dry. In other words, the apparent relapse in so many cases is due simply to the fact that the integument lining the middle

ear cavity and the mastoid cells, is improperly nourished. This integument forms the lining of a blind pouch where it is subjected to increased temperature, increased moisture, the absence of light, and no circulation of air, these latter conditions being essential to the proper nutrition of the normal skin. Moreover, it must be remembered that this tegumentary lining is applied closely to the bony walls of the cavity, with very little connective tissue substance intervening. It is not strange, therefore, that desquamation should take place from time to time, in such a cavity, and that the desquamated epithelium, if allowed to remain in position, should gradually accumulate until the cavity becomes completely filled with these epithelial cells. The pressure of these cast-off cells causes superficial ulceration of the underlying tissue, so that complete desquamation of a cavity of this kind frequently takes plaec. These attacks of desquamation of the cavity occur less and less frequently as time goes on, because the integument gradually adapts itself to its new habitat, and in the course of time is able to conform itself to its anomalous position. These attacks of desquamation should not be looked upon as a recurrence of the otitis. As before stated, they are easily relieved by the removal of the epithelial detritus, and the sterilization of the walls of the cavity.

When the radical operation was first proposed, and, I am sorry to say, even at the present time, many surgeons have hesitated to advise the procedure for fear of impairing the function of audition, as the result of operative interference. In the series of cases in which I have advised this operation, I can state that in but very few instances has the hearing been made worse by this procedure.

Out of 111 cases, in which the hearing records were kept, the hearing after the operation was good in 99, was fair in 9, and was bad in 3. By "good hearing," I mean hearing where the whispered voice was heard anywhere from 5 feet to 15 feet, and by "fair hearing," where the whispered voice was heard from 3 feet to 4 feet or 6 feet. In the 3 remaining cases, where the hearing is recorded as "bad," the hearing was worse than before the operation.

If the operator exercises caution in his manipulations, and is careful neither to dislodge the stapes, nor to impact it in the oval window, he can promise the patient almost certainly that the hearing will not be greatly interfered with, as the result of the operation. This remark applies to those cases in which the hearing is considerably impaired before the procedure is undertaken. Given, for instance, a case of chronic middle ear suppuration, where the low whisper is heard at a distance of 10 feet, in such a case, impairment of the

hearing might follow operation. With a whispering distance of 3 or 4 feet, however, the hearing would hardly become impaired as the result of the operation, while the chances of improvement in the hearing would be considerable.

I have a number of cases at the present time under observation which were subjected to the operation a number of years ago. In these cases, the hearing has steadily improved, owing probably to a gradual mobilization of the stapes by sound waves. In those cases, therefore, where no labyrinthine lesion exists, as evidenced by careful functional examination, and where there is a moderate impairment of hearing prior to operation, the surgeon need not hesitate to advise the procedure for fear of impairing the function of the organ. The hearing is more apt to be improved by the operation than to be impaired by it.

Referring to those unfortunate cases where a partial or a complete facial paralysis results from the operation, either immediately, or where it supervenes at the end of a few days, I can only say that in my own experience, the function of the facial nerve has ultimately been restored in every instance. Out of the last 95 cases operated upon, facial paralysis occurred in 4 instances, and in every instance, the function of the facial has been restored.

Of the series of cases previously reported, the exact number of instances in which the facial was involved is not definitely known. (*Transactions of the Seventh International Otological Congress.* Bordeaux, 1904.) I should say, however, that secondary paralysis occurred in about the same proportion of cases in these two series. In those cases where facial paralysis comes on at the end of two or three days after the operation, the function of the facial nerve is usually restored at the end of two or three weeks, although I have seen several months elapse before power was completely restored to the facial muscles. In those cases, where facial paralysis comes on immediately after the operation, the period before complete recovery takes place, is often long. Here, six, seven, eight, or even more months may elapse before all evidences of facial paralysis disappear. If, however, the facial nerve is not completely severed at the time of operation, I believe that its function will be entirely restored in the very large proportion of instances. Where facial paralysis does occur, it is best treated by daily applications of either the galvanic or faradic current, the galvanic being used where the muscles do not react to faradic stimulation. Where the muscles react to faradism, the faradic current is used. In addition to the

use of electricity, the administration of strychnine internally, seems to hasten the restoration of the function of the nerve.

You will understand that I am speaking now simply from my own statistics, and in no single instance have I seen, in my own cases, permanent facial paralysis follow the operation.

So much for the ultimate results obtained in these cases.

Certain questions have come up in regard to the technique of the operation, which may perhaps be discussed here. *First,* the advisability of primary grafting. *Second,* the advisability of secondary grafting at the end of five to ten days after the primary operation. *Third,* the advisability of the introduction of grafts through the canal. *Fourth,* anomalous methods of healing after skin grafting.

There is no doubt in my own mind as to the advisability of employing large skin grafts for lining the bony cavity formed during the radical operation. It is true that all of these cases will recover, and will recover quite as well if skin grafting is not employed. From a considerable experience, however, I am absolutely certain that the period of convalescence is shortened if skin grafting is employed, either as a primary procedure or from five to ten days after the original operation.

Out of the last 95 cases, primary grafting was employed forty-eight times. The grafts did not take in every instance, but in at least 75% of the cases, the grafts adhered either in part or throughout. The application of either primary grafts or of secondary grafts certainly shortens the convalescence.

Regarding the advisability of applying grafts through the external auditory meatus, this procedure has been advocated by a number of writers. I have employed this method in but one instance. Here the result was satisfactory, but here also, the external auditory meatus had been very greatly enlarged by means of a plastic operation. I do not think that the application of Thiersch grafts through the external auditory canal is applicable to a very large proportion of cases, and I prefer therefore, to apply the grafts either at the time of the first operation, or to do a secondary operation for the purpose of grafting the wound through the posterior opening.

As to whether the skin graft is to be inserted at the time of the primary operation, or at a later date, this will depend somewhat upon the choice of the operator, and very largely upon the pathological conditions found at the time of the operation. If the case operated upon is what may be termed an "interval" case, that is, if there are no symptoms of acute suppuration, if there is but little

fluid pus in the mastoid antrum and mastoid cells, and if neither the dura or sinus is exposed at the time of the operation, I believe that primary grafting should be the rule. The fact that either the sinus or dura in the middle cranial fossa is exposed at the time of the primary operation, does not necessarily prevent the operator from lining the interior of the cavity with a skin graft, provided the sinus and dura seem normal. Care should be taken, however, that the grafts be applied only to those parts of the middle ear not in the immediate vicinity of the exposed sinus or dura. Where the sinus has been exposed, it is my invariable rule not to close the posterior wound completely, but to insert a small gauze drain over the sinus and bring it out at the inferior angle of the wound. This gauze drain is removed at the first dressing, and may or may not be replaced, according to the condition found. In cases which are particularly foul, that is, where the mastoid cells are found to contain fluid pus, or where the necrosis is extensive, I seldom employ primary grafts. In these cases the posterior wound is not sutured. The plastic operation on the auricle is done, the posterior wound packed and the case dressed first on the third or fourth day. After this time, it is dressed daily until healthy granulations are found, lining the entire radical cavity. Any time from five to ten days will be a favorable time for grafting upon these granulations. Of course, after the secondary grafting, the posterior wound is completely sutured.

There is one method of healing which has been observed in a number of cases that have been grafted primarily. In certain instances it is unwise to apply the grafts over the entire bony cavity, owing either to exposure of the sinus over a limited area or exposure of the dura. In cases where the cavity is partially grafted, and the remainder allowed to heal by granulation, the grafts may become incarcerated in the granulation tissue; that is, if the graft is applied to the fundus of the bony cavity and not to the walls, granulations may spring up from the walls, and for a time almost completely hide the grafted area. As these granulations are controlled, however, the fundus of the canal will gradually appear, and the graft will be found in place and adherent, and the fundus dry.

Another condition which is sometimes met with, is an adhesion between the upper wall of the operation cavity and the facial spur. In cases where the middle cranial fossa lies very low, it is sometimes impossible to prevent this adhesion from forming. On examining the ear we find the radical cavity divided into two parts by a septum or partition, a posterior portion, made up of the mastoid cavity, and

an anterior portion comprising the atrium and vault. In some instances, this septum may extend nearly to the meatal opening. We seldom find the ear perfectly dry while this septum is present. If simple cleanliness is observed, however, the septum gradually disappears, and after an interval of from three to nine months after the operation, the entire radical cavity will be found to have resumed its proper form. In one instance, I remember that this septum so obstructed drainage, that it was thought a secondary operation might be necessary. Simple division of the septum and packing the wound with gauze, brought about a complete and permanent cure.

I have attempted to present the results folowing operation as clearly and concisely as possible. The paper simply embraces a study of my own cases, and does not deal at all with the experience of others.

17 West 46th St.

A Remarkable Case of Diphtheria. MASAGER. *Rev. Hebd. de Laryngol. etc.* April 8, 1905.

Dr. Masager was called to a nine-year-old boy suffering from diphtheria. He found him cyanotic to such a degree that he already appeared asphyxiated. He practiced immediate tracheotomy with a pocket knife and inserted a rubber drain for a canula. A large piece of bronchial exudate of a diphtheritic nature was expelled. In spite of a pneumonia which developed afterwards, the child recovered.

SCHEPPEGRELL.

CAVERNOUS SINUS THROMBOSIS IN CHILDREN FOLLOWING MASTOID INFLAMMATION.

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Before considering thrombosis of the cavernous sinuses in children arising from mastoid disease attention is first called to their anatomical relations.

The cavernous sinuses, two in number, one on each side of the body of the sphenoid extend from the sphenoidal fissure in front to the apex of the petrous portion of the temporal bone behind. Anteriorly they receive the ophthalmic veins; internally, communicate freely with each other by two and sometimes three smaller circular sinuses partly enclosing the pituitary body and posteriorly, terminate by dividing into the superior and inferior petrosals. They are quite large, divided by fibrous bands and trabeculae into irregular lacunar cavities. An idea of their considerable size may be had when it is understood that the internal carotid artery and sixth nerve pass through the sinus, while contained partly in its outer wall are the third, fourth and opthalmic division of the fifth nerve. On its internal surface the cavernous sinus is separated from the sphenoidal cavity by the thinnest of bony partitions. Sometimes in an anatomical specimen showing very irregular and narrow sphenoidal cavities projecting well laterally the sinus is situated almost directly above one of them. The sinus has tributaries above from the frontal lobes of the brain and below communicates with other veins in the neck. through the foramina ovale, Vesaliis and the cartoid canal.

While this paper deals merely with the picture of thrombosis arising from the temporal bone it is readily inferred from its position that infection is possible from four directions; superiorly and very rarely by traumatic inflammations following the superior longitudinal sinus and cerebral veins; inferiorly by direct caries of the body of the sphenoid and posterior ethmoid cells and through the foramen ovale from the pharynx; anteriorly and commonly by infective inflammation of the orbit, nose and face passing backward along the ophthalmic veins; lastly and fairly frequently in children by the infection, arising posteriorly from a mastoid focus, being carried directly forward against the venous current along the petrosals, usually the superior petrosal. The lateral sinus and in-

ternal jugular vein are first effected, the thrombus extending from the lateral into one of the petrosals.

It seems possible, however, to get a thrombus in the cavernous sinus by way of the petrosals with only a small thrombus in the upper part of the sigmoid curve; or, if the tegmen tympani be badly perforated, the superior petrosal may be directly involved. In caries of the petrous portion, the veins emptying into the inferior petrosals present a not altogether improbable means for extension

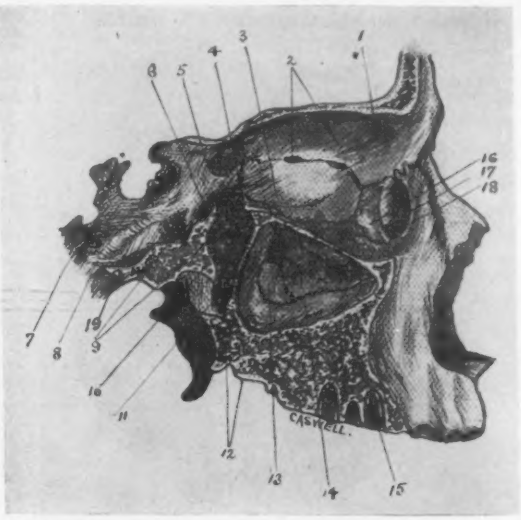

Fig. 1. Sagittal Section Facial Portion of Skull passing through Right Orbit, a little internal to centre, opening up Antrum and Spheno-Maxillary Fossa. (After Quain.)

1. Trochlear Fossa. 2. Infra-Orbital Canals. 3. Ethmoid Bone. 4. Palatine Bone. 5. Optic Foramen. 6. Sphenoidal Fissure. 7. Foramen Lacerum. 8. Linquella. 9. Foramen Rotundum. 10. Spheno-Palatinal Foramen. 11. Pterygo-Maxillary Fissure. 12. Posterior Palatine Canal. 13. Palatine Bone. 14. Inferior Turbinate Bone. 15. Uncinate Process. 16. Lachrymal Bone. 17. Lachrymal Groove. 18. Nasal Duct. 19. Vidian Canal.

of further trouble. Sometimes with perforations through the anterior bony canal wall or a line of suppurating cells far forward in the Zygoma, the veins of the diploe passing inwards through the internal table and emptying into the superior petrosal may be the means of infection. Fortunately the lymphatic system does not play a part in this region as, it is now generally agreed, the encephalon and its membranes are without such a system.

Secondary thrombosis of brain sinuses has lately become recognized as more frequent than we had commonly supposed. Often in post-operative mastoid cases which develop sudden temperature and unusual symptoms of prostration and then quickly subside, it would appear as if there must have been some disturbance or partial stasis at a point in the nearest sinus, the current by pure physical force soon being reestablished and the moderate inflammation of the wall which led to the phenomenon being overcome by an effort on the part of nature. Where a physical examination, thorough search of the mastoid wound and middle ear reveals nothing of importance this explanation is tenable.

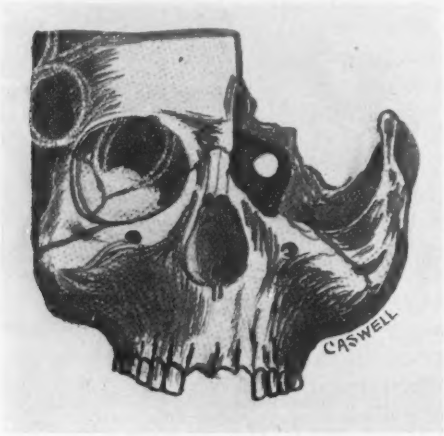

Fig. 2. Opening of Left Sphenoidal Sinus into Nose showing Anterior Wall which is removed. Portion of the Inner Orbital Wall has been chiseled away.

The usual course of thrombosis of the cavernous sinus arising from acute purulent otitis media in children is as follows:

The patient, a boy of seven let us say, has had no previous ear trouble until five or six days before coming under observation, when he is taken with a sudden severe pain in one ear followed by otorrhoea and slight mastoid tenderness. There may have been a decided pneumonia, the middle ear and mastoid soon sharing in the invasion of the pneumococcus. Otorrhoea and mastoid oedema increase, extending perhaps anterior to the auricle, the swelling

involving the region of the parotid gland. Paracentesis, mastoid operation and sponge baths have no effect, the patient growing worse. Slight chills are then noticed and may be quite constant, without convulsions or vomiting. The temperature rises rapidly and in a few days may reach 104° to 105½° F. with an accelerated pulse. The oedema anterior to the auricle has now extended forward over the zygoma and side of the face with tenderness along the course of the internal jugular vein.

Fig. 3. 1. Location of Left Cavernous Sinus. 2. Showing extent of Inner Orbital Wall which is taken away and Right Nasal Septum.

If the case perhaps be not seen by the aurist until this stage is reached the mastoid is opened, lateral sinus incised, and internal jugular ligated in the neck. In another twenty-four to thirty-six hours the temperature instead of remitting continues very high and irregular. The pupils are contracted, react sluggishly to light or not at all. The little patient is dull and partly comatose. Optic neuritis is observed. Babinski perhaps on one side. Kernig's sign plus and reflexes lost. Often there is already slight chemosis of the lids and a suggestion of orbital cellulitis on the same side with the swelling of the face and temple. Occasional half involuntary movements of the bowels and transient epileptiform attacks follow.

We know that the prognosis is bad, but are somewhat doubtful as to just what is taking place. Beginning cavernous sinus thrombosis is more compatible with the symptoms than cerebral abscess, multiple extra-dural abscesses or a wholly general purulent meningitis. The patient is delirious, tossing about as if in great pain There may be slight divergent strabismus, difficulty in swallowing, and a beginning metastic abscess in a distant joint.

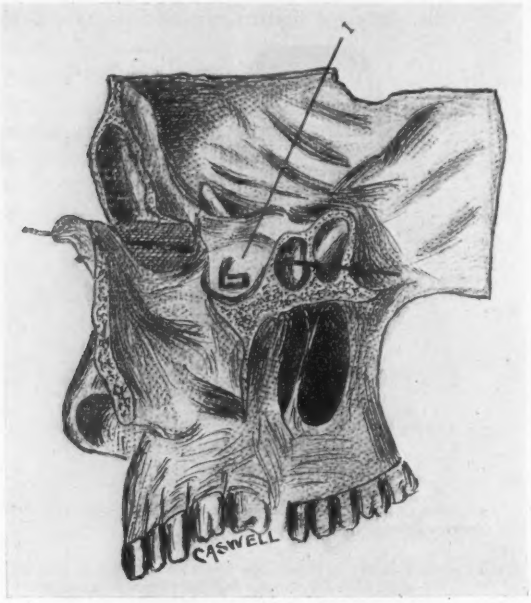

Fig. 4. I. Inner Wall of Left Cavernous Sinus. Section of Skull just Anterior to Posterior Wall of Sphenoidal Sinus. Most of the Right Orbit has been removed.

Chemosis of the lids and exopthalmos of the eye on the same side with the mastoid soon follow and gradually increase. The orbital cellulitis may become tremendous with sub-periostial abscess or even panophtalmitis. In forty-eight hours chemosis of the lids and exophthalmos of the other eye is sure to follow. The exophthalmos and chemosis of the lids may finally be seen to vary, becoming more marked in first one eye and then in the other, or

alternating. Death quickly follows from septic exhaustion, the temperature rising occasionally as high as 107° F.

It is remarkable how long a case so septic will linger, often several days. The whole duration of the sinus disease is rarely over six or seven days.

Pain in and around the eyes during the early stages is usually an unknown quantity, the patient being so young that little information is expected in that direction. Stupor varies with periods of semi-unconsciousness. A study of motor paralysis is difficult on account of the general oedema. The lids and whole side of the face has a dusky hue due to venous engorgement. At times ecchymotic areas are seen. The eye is pushed toward the temporal side and the exophthalmos is so great that part of the globe protrudes between the lids. The cornea may show ulceration or a general haziness. In one half the cases death takes place before the eye is lost. Most authorities report the pupil dilated. In a case where the media remained clear engorgement of retinal vessels was not observed. When the second eye is involved the process is at once seen to be independent of the other eye and not to have jumped across the forehead or bridge of the nose.

The diagnosis when the eye symptoms appear together with the known mastoid focus, is easy and there can be but small chance for a mistake. In the ophthalmic cases where the trouble started anteriorly, working back, it would seem next to impossible to be sure of the diagnosis until the second eye showed involvement. There is this to be said, however, that any case of exophthalmos with marked toxic features must be regarded as suspicious.

The condition is to be differentiated from orbital cellulitis and perhaps beginning erysipelas. Septic infection of the frontal sinus is not likely to be met with in a child.

At autopsy there is usually an extensive leptomeningitis at the base. The dura in the immediate neighborhood and along the path of the infection is found thickened and discolored. The brain itself is in a fairly healthy condition. There is marked erosion of the bone everywhere in contact with the cavernous sinus and caries of the roof of the orbits. The staining of the bone is a prominent feature, varying from livid green to black. The body of the sphenoid is sometimes softened to a considerable degree, the bone spaces being infiltrated with pus. Distinct bubbles of gas may escape when an instrument is forced into the necrotic bone. The cavernous sinuses are partly disintegrated. Extra-dural abscess

may be present. Both petrosals, lateral sinus and internal jugular vein may all be thrombosed. Extensive caries of either petrous or squamous portions of the temporal bone or perforations through the tegmen tympani and anterior bony canal wall are usually present. There may be marked caries in the region of the jugular bulb. The lungs show, as a rule, pneumonic patches. Cultures show the streptococcus, pneumococcus and occasionally the diplococcus intracellularis.

Why perforations through the anterior bony canal wall of the external auditory meatus should occur so frequently is hard to explain.

In Lodge's[1] case, a woman age 41 years, the process extended from a left peri-tonsillar abscess following the pterygoid plexus. Autopsy showed septic thrombosis of the cavernous sinuses and both sphenoidal sinuses filled with pus.

Dwight and German[2] in one of their cases (adult) in which the process extended from a carbuncle on the back of the neck, report: left lateral, petrosal and both cavernous sinuses thrombosed. All small sinuses around pituitary body were enlarged and filled with pus. Pressure on the eyeball caused pus to be forced out of the orbit, apparently along the track of the ophthalmic veins. There were abscesses in both lungs.

Owing to the scarcity of post-mortem records in cases following mastoid disease, considerable time should be spent in stripping off the dura, examining the dura for inflammation, the veins and sinuses for thrombosis and the bone everywhere for discolorations and necrosis. The orbit, internal ear, neck and lungs should perhaps be given a special examination.

Virchow has aptly said "A post-mortem does not admit of repetition, whereas in a clinical examination at the bedside any omission may ordinarily be rectified at a subsequent visit."

The rational treatment of such a septic condition consists in incising and draining the cavernous sinus directly. If the aural surgeon does not care to make the attempt a general surgeon can always be found who will. Although the cases are apparently moribund, with the full knowledge and consent of the parents an operation should be performed. In a beautiful paper which must be considered classic Dr. Knapp[3] reports this very successful sinus operation by Dr. Frank Hartley following the Gasserian gangolin route. Dr. Knapp mentions that he was able to follow the entire operation closely, one cavernous sinus being clearly seen. I can

but quote his conclusions, at a time too, when the disease was more rarely recognized and less fully understood: "The method of osteoplastic resection, in this almost inaccessible neighborhood, simultaneously preached and made known by Hartley and Krause may be applicable not only to the rare cases of aseptic thrombosis of the cavernous sinus, but also to the infectious otogenous thrombosis."

Dwight and Germain clearly demonstrated a month previously that a cranial operation is not associated with extreme difficulty but must be quickly done. The slight hemorrhage in both instances was easily controlled.

In a former paper[4], a route to the sinus was advanced from work on the cadaver, applicable to the class of cases which die before the eye is lost. The plan proposed was: to remove the inner wall of the orbit, the nasal bone on that side, and the anterior and thin lateral wall of one sphenoidal cavity against which lies the cavernous sinus. The eye is retracted from the field. With the nasal structures wanting the work is performed in a fairly good light. A portion of the roof might also be opened in the hopes of striking one of the circular sinuses. Using a stout and properly curved curette, chisel and bone punch, the sphenoidal wall is first cracked and then removed.

It would almost seem justifiable to introduce a trochar into the sinus in some of the cases, if for no other purpose than diagnosis. A thrombosed sinus will not bleed. Opening one sinus should drain both.

The chief danger encountered is the internal carotid artery. To avoid this, tying off the carotid in the neck before beginning the operation has been suggested.*

Enucleation of lost eyes as has been practiced will not drain the sinus. It does seem however that with a complete exenteration of the orbit and following the ophthalmic vein backward through the sphenoidal fissure some drainage should be secured. A good part of the apex of the orbit would necessarily have to be chiselled away to accomplish this.

Dr. H. P. Mosher† expresses the opinion that this method appears hopeful particulraly as the optic nerve is already destroyed and some of the larger nerves paralyzed.

It is to be lamented that the older ophthalmologists who have undoubtedly seen a good many cases have not given the profession the benefit of either their observations or possible experiments.

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The following concluding remarks will perhaps not seem out of place: An examination of the inner or cerebral surface of the base of the skull shows each middle fossa corresponding roughly to an inverted funnel, the apex having several openings, i. e. the sphenoidal fissure, foramen rotundum, foramen ovale, foramen spinosum and the orifice of the carotid canal. The thin walls of the sphenoidal sinus also form a considerable part of the inner lower floor of this funnel. An opening upward through one of these sphenoidal cavities, theoretically, would be a measure to drain not only the cavernous sinus but if followed beyond, the greater part of the entire base of the middle fossa.

The operative plan previously outlined for draining the cavernous sinus is practically outside the dura (sub-dural) and leaves the dura mater and brain substance untouched. A chance for increasing an already existing meningitis by mechanical manipulation in this way might possibly be avoided.

It would seem that if only a small hole be opened pus or semi-clotted blood would eventually find its way out following the natural law of gravity. I see no reason why a concomitant extra-dural abscess if positively located anterior to the petrous portion of the temporal bone, well towards the median line might not also be reached.

It is remarkable the size of the sphenoid sinuses and their openings into the nose. A considerable portion of the inner wall of the orbit can be removed without encroaching on the orbital floor which forms the roof of the maxillary antrum. When once in the nose, with the nasal bone, ethmoid cells and middle turbinate removed, one can hardly miss the sphenoidal cavity. It is impossible to go too far posteriorly as the curette will encounter the thick, hard, cellular body of the sphenoid which forms the posterior wall of the sphenoidal sinus.

I do not believe the internal carotid artery will prove such a difficult problem after all as its location is quite far posteriorly, rising abruptly as it runs forward. The location of this artery seems fairly constant.

On one specimen a large dehiscence was noticed opening into the carotid canal. Evidently during life, a layer of fibrous tissue only separated the carotid in the cavernous sinus from the air in the sphenoidal cavity.

I believe the plan of approaching the middle fossa as given will be much better than an attempt to chisel away the apex of the orbit

Whether opening the middle fossa would help a general purulent meningitis in this region is also a problem worth considering.

BIBLIOGRAPHY.

1. *Annals of Otology*, Vol. xii, page 449.
2. *Boston Med. and Surg. Journ.*, May 1, 1902.
3. KNAPP. A Case of Traumatic at First Doubtful Orbital Sarcoma, Followed by Aseptic Thrombosis of the Cavernous Sinus. Note.—Successful sinus operations by Dr. Frank Hartley—death later by extension of the neoplasm. *Arch. of Ophthalmology*, 1900, p. 463.
4. LANGWORTHY, H. G. THE LARYNGOSCOPE, July, 1906, No. 7, Vol. xvi.

DAY. *Annals of Otol.*, Vol. xi, page 520.

DWIGHT and GERMAIN—Append exhaustive references. Thrombosis of the Cavernous Sinus; With Report of Four Cases, Including One Cranial Operation. Operation by Dr. E. W. Dwight.

ELLETT, E. C. *Journ. Amer. Med. Assn.*, Vol. xliii, 1900, page 1865.

FINLAY, C. E. *Ann. of Otol.*, Vol. xxxii, page 419.

BROUNER. *Brit. Med. Jr.*, Nov., 1905.

JACKSON, E. Trans. Amer. Ophthalmol. Soc., 1901.

JACK, E. E. Trans. Am. Ophthalmol. Soc., 1902.
Path. Report by Verhoeff, F. H.

SNELL, S. *Amer. Jr. Ophthal.*, June, 1906.

Remarks on Some Abuses in the Intranasal Surgery of To-day.

JOHN N. MACKENZIE. *N. Y. Med. Journ.*, Jan. 28, 1905.

A word of warning is sounded by the author in his interesting and emphatic manner. The sudden craze for operation has caused the pendulum to swing too far from rational boundaries. The amount of reckless surgery done in the nasal passages will never be known.

We should appreciate the responsibility of our position as teachers and see that the pupils of our institutions and post-graduate schools are taught conservatism and moderation in the surgical treatment of the simpler affections of the upper air tract.

LEDERMAN.

WHAT IS THE PRESENT STATUS OF THE OPERATIVE TREATMENT OF DEVIATION OF THE NASAL SEPTUM? A CRITICAL REVIEW BASED UPON LITERATURE, AND ESPECIALLY A PERSONAL EXPERIENCE OF 127 CASES OPERATED UPON BY VARIOUS METHODS.*

BY JOHN R. WINSLOW M.D., BALTIMORE, MD.

It is with considerable hesitation that I presume to present to this Association, numbering among its members many of the makers of rhinology, in the volumes of whose Transactions its history is recorded, so time-worn a theme. I must confess, however, that for some time I myself have felt uncertain and perplexed as to where we stand in the treatment of septal deviations; others too, must have felt the same doubt, for I learn that this is to be a subject for discussion at the coming meeting of the British Medical Association at Toronto.

The era of the Asch operation, as the only, or even the principal one, has passed and the submucous operation is now dominant; this is attended with all of the enthusiasm and eclat of a new procedure, and for the time being has overshadowed all others Have we at last reached the much desired goal, and found in this a panacea for all varieties of septal deformity? Many so think. Are the older classical operations to be cast aside as superannuated and useless?

Lack of sufficient experience and an inadequate number of recorded cases were formerly the reproach cast upon these methods. Surely there are now upon record enough cases of each of them, to enable us to determine their exact value and definite indications.

There is no single method suitable for every variety of deformity but all of them give good results in certain cases. It seems to me that the indications for the selection of each particular operation in definite types of deformity have not been sufficiently defined. The lack of detail in recorded cases would seem to indicate insufficient preliminary study. That the older methods have not met every requirement and have not proven entirely satisfactory is evident from the many operations and the constant striving after new ones. I believe that we might profitably endeavor to ascertain at this time the *causes of failure,* and the directions in which *improvement* is to be desired and is attainable.

* Candidate's Thesis read before the 28th Annual Congress of the American Laryngological Association, Niagara Falls, May 31, June 1 and 2, 1906.

Among the most important causes of defect or failure in results may be enumerated:

1. Lack of detailed preliminary study of each individual deformity as a distinct entity, and failure to adapt to the particular variety of deformity that operation best suited to it. An exact knowledge of the anatomical and clinical peculiarities of the different forms of deformities is absolutely essential to enable us to select the right method and perform the same properly. Careful preliminary inspection under cocain is essential to accurate diagnosis, but inspection alone often yields erroneous impressions. The graduated probe is often requisite to determine the distance and extent of the deformity, the consistence of projections (tubercle of septum, etc.) and the depth of the concavity in angular deformities; at times the finger-tip may profitably replace the probe; the septometer is sometimes necessary to determine the thickness of the septum.

2. The excessive use of general anesthesia and consequent *inexact application* of the method used, is another source of faulty results. A single incision precisely applied in the right location, will accomplish more than multiple incisions or general crushing applied at random, and will avoid the risk of sloughing of the septum and of sepsis. It is then of the utmost benefit, whenever possible, to operate under visual inspection and cocain anesthesia, using adaptable instruments permitting the accurate application of incisions in whatever location they will be most effective.

Indications: While some degree of septal deviation is so common that it may almost be regarded as its normal condition, a deviation becomes pathological only when it interferes with normal nasal function, producing consequences that can rationally be attributed to the deformity; according to Beaman Douglas, this occurs in from 11 to 12% of cases only. Some of the most marked deformities that I have ever seen caused no detectable disturbance. We should operate therefore only for the relief of definite symptoms, and not simply because of anatomic abnormality.

The object of operation is the restoration of the nasal functions, not only the respiratory, but the aural, the vocal and the drainage functions as well. Unusual subsidary indications may consist in the relief of pressure neuroses and as a means of diagnosis and treatment in affections of the superior regions of the nose (attic). The test of success is not absolute symmetry, but the restoration of the defective nasal functions to normal.

Classification: From an operative standpoint it is essential for us to know the following details as to the deformity:

1. The location; whether anterior, posterior, superior or inferior, which determines the accessibility, i. e. ease of operation.

2. Composition, i. e. the parts which take part in it, whether quadrangular cartilage, nasal spine, vomer, lamina perpendicularis, etc., determining the kind of instruments available, whether knife, saw, chisel or cutting-forceps.

3. Thickness (interstitial), also governing the selection of instruments and method.

4. Shape, whether having a plane or rigid surface, with or without an overhang; also whether of a simple or complex form; determining the selection of method.

In my experience the possible *sites* of deflection in the order of their frequency are: 1. Dislocation of the lower border ("pyramidal cartilage"). 2. Deviation or dislocation at the chondro-vomeral articulation (angular). 3. Incurvation of the face of the quadrangular cartilage itself (bowed, angular and sigmoid). 4. Deviation or luxation at the chondro-ethmoidal articulation (vertical angular). 5. Deviation at the chondro-vomero-ethmoidal articulation (ascending angular). 6. Incurvation of the face of the perpendicular plate of the ethmoid (bowed or angular), usually associated with deformity of the cartilaginous septum (sigmoid).

Shape: There is an innumerable variety of septal deformities, which may be classed as simple and complex. A simple deformity presents an incurvation to one side only, having a regular, smooth surface. A complex deformity consists of a combination of deflections and a variety of shapes, which may be so irregular as to defy description; or it may be associated with various complications, either septal (dislocation, synechia, thickening) or extraneous (turbinal, polypi, adenoids).

All these deformities occur with and without thickening; thickening may be superficial (crests and ledges) or interstitial (fibrosis). The term "redundant" should be reserved for excess of septum en masse with relation to the vertical and horizontal measurements of the nasal chamber, and should not be applied to superficial or interstitial thickening.

The nostril is only as wide as its narrowest portion; a linear vertical deviation ("pyramidal" cartilage, anteriorly; osseocartilaginous junction, posteriorly; hypertrophied "tubercle") may as completely block the passage of air as an extensive deformity.

The *treatment* of septal deviation is exclusively surgical. A discriminating and impartial observer, however, must admit that the operation is often unnecessarily performed, when the same results could be secured from simpler, safer and surer methods.

Conservatism and judgment in the *selection* of cases for the operation are indispensable. We have not yet attained that degree of certainty in results by any method, which warrants us in regarding this as a minor operation to be performed in doubtful cases, or for the relief of trifling symptoms. "The magnitude of operation must not exceed the importance of symptoms." (Semon.) If the cases are properly selected, I cannot understand from whence come the hundreds of cases now being reported annually.

The best treatment of deviated septum may consist in avoiding the operation by resorting to simpler operations upon the turbinals or septal thickenings. But frequently the removal of thickening alone is not sufficient to establish free respiration upon the narrower side, and the deviation must also be corrected.

The shock of septal operations may be considerable and preliminary tonic treatment of the patient and of the nasal mucous membrane is desirable.

The method selected should be the simplest available in the particular case, and should be adapted to the patient with respect to age, temperament and physical condition; it should also be adapted to the character of the *deformity*, as to its location, composition, shape and thickness.

The *indications* in the correction of these deformities are: 1. To overcome the resiliency of the septum. 2. To provide for "redundancy." 3. To replace the septum in its normal position. 4. To retain it in this position until it becomes fixed.

All methods that fulfill these requirements will be successful. The wonderful resiliency of the cartilage has proven the stumbling block. To overcome this various methods have been employed: 1. Comminution or fracture with forceps: Adams, Roe, Kyle. 2. Incisions of varying number and direction: Asch, Moure, Douglass, Allen, Roe, Gleason. 3. Resection of the entire deviated area, with preservation of the fibro-mucous covering on one or both sides: Krieg, Killian, Freer, Ballenger, *et al*.

Experience has taught the utter failure of methods dependent upon crushing alone, owing to the impossibility of fracturing the uncut cartilage with forceps, as well as that of crowding a "redundant" septum into a nasal chamber too small to contain it. Most methods are based upon a combination of incision and frac-

ture. It is an essential requisite for success by any method that the incisions should include the posterior portion of the deformity.

In undertaking a critique of the various methods of operation, I wish to disclaim at the outset any intention of reflecting upon the pioneers in this line of work, or of holding them responsible for failure to foresee the improvements that have since been built upon the foundations that they laid; nor need any feel slighted at failure on my part to discuss his special variety of procedure, inasmuch as these remarks will be exclusively confined to those methods with which I have had individual experience. Having no personal method to advocate, I believe that I may be exonerated from the imputation of partiality.

Case Analysis. All cases utilized in this analysis were carefully selected upon rigid indications and personally performed, hence their relatively small number. None of my cases performed prior to the Asch era is included. These operations were performed, 105 at the Presbyterian Eye, Ear and Throat Hospital, 15 at the University Hospital, and at my private office, during the period from February, 1892, to May 1st, 1906, and are distributed as follows:

Asch principle	45	cases
Douglass principle	37	"
Gleason operation	23	"
Supralabial operation (alone)	2	"
Submucous operation	15	"
Varia (Bosworth, Krieg, Roe, Moure)	5	"
	127	"

Anesthesia, general 60%; cocain 30%; combined 10%. Analysis of recent cases only, practically reverses this percentage.

Hemorrhage, 2 cases of secondary, having no relation to the type of operation. Results, see special operations, bearing in mind that the Asch had to bear the brunt of inexperience and lack of skill.

Analysis of my personal cases shows 40% cartilaginous, and 60% mixed (10% bony). Also the usual excess of males (70%), to my mind an argument in favor of their traumatic origin. Angular deformities exceeded the bowed (70%).

Among the 127 cases were 5 of separation of the cartilaginous plates, not including so called "pyramidal" dislocation.

Here is no fitting place for a detailed description of the various standard methods, yet I cannot advocate too strongly a consultation of original publications which contain the minutiae essential to success, rather than condensed and at times inaccurate text-book descriptions.

The Asch operation: The modern treatment of deviated nasal septum may be said to date from the first operation of Morris J. Asch, of New York (1882). Prior to that time, various procedures had been employed, successful in certain cases, but no systematic method existed, with detailed after treatment, such as that elaborated by him. This early received the recognition that its merit deserved, and for years has held the dominant position. First published in the Transactions of the American Laryngological Association, 1890, this method has since been republished by so many different writers and in so many different forms, that its technic should be familiar to every one. Yet the Asch operation, though one of the most extensively published, is still a most misunderstood and misapplied method.

In his final paper, Asch emphasized the most important points in connection with the operation, and the main cause of failure or complication in results. The method is applicable to the cartilaginous septum only, and the forceps are intended neither for fracture, nor for torsion, but for compression alone. Observation of numerous operators will demonstrate that these restrictions are being constantly ignored. They should be engraved upon the mind, if not the instruments, of every one employing this method.

Another essential is that the crucial incisions shall be placed over the most prominent part of the deviation. Here we find the great defect of the Asch, and similar fixed, instruments, inasmuch as in high grade, bowed or angular deformities, this is an impossibility, especially under anesthesia, even with the small sized scissors now available. The horizontal ones are particularly hard to introduce, may strip off the mucous membrane, and are intended for exceptional use only.

Since the modification in the Asch splint by Emil Mayer, there have been no alterations in the method, except that they are now boilable without change of shape. Kyle's modification of Mayer's splints, being made of block tin, are both sterilizable and malleable so that they can be adjusted *in situ*, as occasion demands, and seem to have distinct points of advantage over the original ones. A longer size for posterior deviations is now available.

The suggestion first made by C. W. Richardson of Washington, that the splints left in the nose continuously for a period of 7 to 10 days with careful supervision, and then removed permanently, has simplified the after treatment in the many cases in which it has proven applicable. Asch claimed 5 minutes as the average time of performance of the operation and 4 weeks as the average of after treatment.

While the Asch operation may be available in other varieties of deformity, it is best adapted to deviations of the cartilaginous septum without thickening, either evenly bowed or moderately angular, when there is ample room on the concave side. The deflection must be well above the nasal and vestibular floor and not too pronounced, else the Asch instruments cannot be inserted properly.

My personal experience with the genuine Asch operation has been somewhat limited, the majority of cases having been performed for purposes of demonstration to undergraduate and post-graduate students. This resulted from no prejudice against the method, but mainly from the character of my early cases, in which the noses were so narrow that the Asch instruments could not be inserted, compelling me to devise instruments of my own.

My early operations were upon the Asch principle, but the incisions were made with special knives devised by myself (1892). These originally presented a double edged triangular pointed blade, at right angles to the shaft, but are now made with a rounded point and resemble somewhat an old fashioned gum lancet (Fig. 1). The

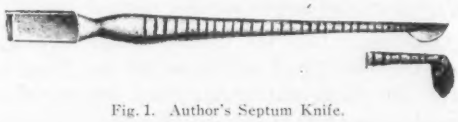

Fig. 1. Author's Septum Knife.

shaft is graduated so that the distance of the point of the maximum deflection having been previously measured, operation under anesthesia is facilitated. There are two of these knives, one cutting horizontally and one vertically, and two lengths of blade, a short one for thin and a longer one for thick septa. They are usually inserted on the narrow side, and the crucial incisions made clear through the septum at its most projecting portion. I have always regarded it as essential to cut entirely through the septum to enable me to satisfactorily fracture it with the finger, hence have seen no necessity for a guard on the blade.

In high grade deviation, it has been at times easier to operate from the wide side, and then the narrow nostril must be protected from injury by the insertion into it of a thin plate of metal or of hard rubber.

These knives have the advantage that they can be ued in an extremely narrow nostril and wherever the deformity is located,

whether high up or near the floor of the nose. Having become skilled in their use and satisfied with the results, I have employed them in all of my subsequent septal work.

In early mixed cases, bony deflections were either fractured with Adams' forceps, at the time of operation, or removed with saw and chisel subsequently. Later Roe's forceps were used..

I have used successively the Asch, Mayer, the Behrens' cork and dental gutta percha and Kyle splints. Whenever possible, I have left the splints continuously in the nose for as long a period as possible (average 8 days). Number of cases by this method, 45 (bowed 19; angular 26). Number of perforations, 5 (10%). Severe hemorrhages, 0.

Results, excellent in 5%; good in 70%; fair in 15%; failure 10%. A good record considering early lack of skill and that cases were not selected with the same discrimination as at present.

A few illustrative cases are appended.

Case I. Miss L. J. White, female, age 14; 1900.

Indications. Nasal obstruction and excessive nasal and post-nasal discharge. *Type of deformity.* Markedly bowed, thickened and ridged septum obstructing right nostril; cause unknown. Compensatory hypertrophy of left inferior turbinal.

Asch operation under ether with horizontal scissors; Adams' forceps; Asch splints. Great force and tenaculum were required to remove the splints on third day. Replaced by McKernon splint. Left inferior turbinal cauterized. Uneventful recovery in 4 weeks with fair result. Two years later resected a septal ledge from the right side with much benefit.

This is an example of bad adaptation of operation to deformity. There was too great bowing and both superficial and interstitial thickening of the cartilage, for the best results by the Asch operation.

Case II. F. A. White, male, age 12; 1899.

Indications. Nasal obstruction. Weak eyes, very nervous. *Type of deformity.* Generally irregular and thickened septum with extreme angular deflection of the cartilage occluding right nares, caused by a baseball bat. Tip of nose turned to the right, bridge somewhat flattened. *Asch operation* with my knives under Schleich's general anesthetic. Behrens' cork splints.

Result a partial success, ridges remaining on both sides of the septum.

About ten months later a Douglass operation was performed with same knives, under ether, McKernon's splints. Result good as to respiration, some improvement of external deformity; nasal bone incurvated.

This case was primarily not suitable for either of these operations, being too thick and irregular. Owing to patient's extreme nervousness a general anesthetic was imperative, which would have handicapped the result by any other method (submucous).

Case III. F. S. White, male, age 34.

Indications. Headache radiating from nose to head. Asthma. Deaf in left ear. *Type of deformity.* Bowed deviation of cartilage. *Asch operation* under ethyl bromide; regular instruments. Mayer-Asch splints.

Patient ran off with the splints in his nose and did not return for one year. Stated that he had removed the splints himself after four days. Functional result good and architectural fair. No perforation.

Case IV. Dr. C. Egyptian, male, age 23; 1903.

Indication. Right nasal obstruction. *Type of deformity.* Cartilage bowed; moderate. Typical *Asch operation* under ether; genuine instruments. Splint *in situ* 10 days. Typical case and excellent result.

Case V. C. A. G., white, male, age 16 years; 1898.

Indications. Nose stopped up completely. Mouth breather. Has had numerous nasal polypi and a postnasal fibroma removed by myself (snare); also a choanal polypus. *Type of deformity.* Angular deviation of the cartilaginous septum to the right.

Typical *Asch operation* and after treatment. Good result. The following year a retro-nasal fibro-myxoma was removed. One year subsequently patient was well and married.

The principal improvement that I would suggest and have often carried out, is the performance of the operation with knives under cocain-adrenalin anesthesia in all suitable cases, under direct visual inspection. When used for compression only, the application of forceps is not very painful, and may be omitted when the septum is not very redundant, and the fracturing with the fingers is thoroughly done; if the flaps are so long as to cause a thickening upon the wide side, they may be resected at once, thus obviating a secondary operation.

Moure's Operation. (Revue hebdom. de Lar. No. 13, 1901.) This is due to a misunderstanding of, and failure to keep up with the improvements in the Asch operation; it is largely used in France and England. The operation is performed with a special pair of scissors resembling the Asch vertical one, having the blades set at an obtuse angle to the handle. The first cut is made as close as possible to the nasal floor and as far back as possible. The second cut is made without withdrawing the scissors, as close as possible

to the dorsum nasi. The two incisions, which must not meet, form a movable triangular flap, which is pushed with the finger into the opposite nostril. A special metallic splint is inserted, and adapted by means of a dilating forceps to the septum, and left in position for 7 or 8 days, at the end of which period the septum is generally fixed in position.

This operation avoids the crucial incision, and separates the septum from the maxillary crest. The scissors are inserted without regard to the location of the deviation. It is very rapidly performed in from ½ to 2 minutes, and can be done under nitrous oxide or cocain.

Moure supposes that the Asch splint is intended to be left in the nose during the entire period of after treatment, and urges that it cannot be kept clean. His splint is intended to obviate this, but has no advantage over that of Kyle. An advantage claimed for this method is that there is no risk of ulceration, as the incisions are above and below the zone covered by the splint.

A limitation to the operation is that there must be plenty of room on the concave side, as the deformity is pushed over bodily into the other nostril. A further objection is that a fissure may ensue along the maxillary crest. The horizontal incision low down near the nasal floor might cause serious hemorrhage.

Case VI. Miss S. O., female, white, age 25; 1904.

Indications. Nasal obstruction, mainly on right side. *Type of deformity.* Moderate horizontal angular deviation of septal cartilage to the right.

Moure's operation with Asch vertical scissors under cocain anesthesia. Simpson-Bernays splint. Result, cure in 10 days.

The Douglas operation (N. Y. Medical Journal, August, 1898) differs from the Asch in that it is performed with a special perforator and knife, and not only the crucial incisions, but the crossing of incisions at any point, is avoided. The incisions are made along the lines of deflection in whatever direction and as far as they may lead, in the belief that these are the seats of old fractures; these lines are determined by preliminary examination, either tactile or visual.

The next step is to force the septum over into the unobstructed side with the finger. Certain modifications of his original method have recently been advocated by the author.

Having proved both by anatomical and microscopical observation that the cartilaginous septum is never fractured by forceps, but per contra that it is torn loose from its articulations and its mucous

membrane lacerated, the author has ceased to use the forceps for this purpose. He, however, deliberately attempts to separate the triangular cartilage from the bony septum, with them.

The author lays particular stress upon the part played by the superior maxillary spine in maintaining the septum in its deviated position, and has adopted breaking it as a *routine measure*, in his operations. This may often be accomplished by crowding the forceps down to the floor of the nose and twisting them from side to side, but it is better in most cases to cut the spine with chisel and mallet, either through the nose or by the supralabial method of Harrison Allen. Since the method of cutting this spine has been adopted, it is often possible to remove the splints in five days. The author prefers to splints, Bernay's sponge, inserted in small strips.

With the finger as a protection, under anesthesia, or guided by the eye, under cocain, there is but little risk of injury to the turbinals. I have therefore never employed the spear-knife and the probe-knife of Douglass, but have used the same vertical and horizontal knives as in the Asch operation. These can be inserted anywhere, wherever there is deviation; hence there is no need of a perforator, which is a complicating and unnecessary step. There is no central point of insertion, but incisions may be made anywhere, hence meeting or crossing of incisions is avoided. It makes no difference from which side the incision is made, as the turbinals on the narrow side may be protected. In my earlier cases under this method, the operation was done under general anesthesia; later the incisions were made under cocain and the nasal spine fractured, when necessary, with forceps, after preliminary saw incision (Kyle). I regard Douglass' proposal to deliberately "tear the triangular cartilage from its attachment to the septal plate of the ethmoid" with forceps, as a distinct retrogression. This separation can easily be accomplished, as I have often done it, by a vertical incision with the knife under cocain-adrenalin, anesthesia and visual inspection; its articulation with the vomer can be similarly severed, when it is dislocated; or when the superior maxillary spine is deflected, this may be chiseled off either through the nose, or by the supra-labial route under cocain or ether. Thus the forceps can be entirely eliminated, and the operation much simplified. It can be performed in from 5 to 15 minutes. I have used the Douglass principle exclusively in 37 cases of cartilaginous deviation and found it a scientifically conceived and successful operation in those cases to which it is applicable. I have had no serious complications nor failures by it. This method is possible in the vast majority of simple

cartilaginous deviations, but it is especially adapted to moderately angular or "ridged" deflections extending in various directions, or in markedly "angular" forms. In the "bowed" variety, a single horizontal or oblique incision is made along the greatest curvature.

This principle is also available for the removal of localized lines of deviation, during or remaining after other operations (Gleason operation).

Case VII. H. C. A., white, male, age 18 years; 1899.

Indications. Obstructed right nostril; external nose twisted to the right.

Type of deformity. Horizontal angular deflection of cartilaginous septum; dislocation from nasal crest and thickening at nasal floor. Deformity of nasal bones. Cause unknown.

Douglass' operation under ether with my knives. Separation by incision, from nasal floor. McKernon splints removed by myself every second day for a week, then by patient every day for another week. Returned to business at end of first week and had completely recovered in three weeks.

Case VIII. H. L. C., white, male, age 19 years; 1904.

Indications. Nasal obstruction on right side. Sense of smell lost. Epistaxis daily from right side.

Type of deformity. Bowed deviation of cartilaginous septum to the right (central). Mucous membrane hemorrhagic. External depression on left side of bridge of nose; caused by a blow while playing basket ball.

Douglass operation. Two parallel antero-posterior incisions with my knives, through most protuberant area, followed by compression with Adams' forceps. Dental gutta percha splint, worn continuously for ten days. Result excellent. External depression subsequently filled with paraffin.

Case IX. H. H. T., white, male, age 30 years; 1905.

Indications. Nasal obstruction on right side.

Type of deformity. Vertical angular deflection at chondro-ethmoidal junction; also anteriorly; joining these an oblique angular deviation in body of cartilage. Dislocation from nasal spine. Tip of nose turned to the left. Cause unknown.

Douglass operation. An anterior and a posterior vertical incision and an antero-posterior oblique incision along the deviated lines, with my knives, under 20% cocain solution. Nasal spine fractured with Adams' forceps under light etherization. Duration (including etherization) 20 minutes. McKernon splint for 3 days. Wry nose improved. Result excellent.

The Gleason operation was first presented to the Philadelphia College of Physicians in October, 1896. The technic is as follows (Laryngoscope, Aug., 1902). A U-shaped flap is cut out of the

whole thickness of the septum (bone or cartilage) by inserting a thin saw beneath the overhang and sawing at first horizontally, and then vertically upward parallel with the septum. Both crura are then extended upward as far as possible, with the saw. The incision must include the entire deviation and not pass through it; the flap is then forced over into the opposite nostril with the finger, and an effort made to fracture its neck and destroy its resiliency. Thus the pendulous flap is retained by the margins of the incisions and there is seldom necessity for splints or other support. This operation can be performed in from 3 to 5 minutes in simple cases, under cocain-adrenalin anesthesia, with a minimum of pain or reaction and when well done gives ideal results in suitably selected cases. An essential point in the success of this method is to completely free the flap, by passing the finger or a curved knife around the incisions, so that it may be subsequently efficiently fractured. It is particularly indicated in pronounced deflections with an overhang, especially the angular form, and gives the best results when the deflection involves the bony septum. We then have a redundant flap and one containing bone, which is readily fractured. This remains in situ without the use of a splint. Cartilaginous, slightly bowed deformities are probably corrected better by the Asch, Douglass, Roe or other methods.

It is not adapted to deviations without an overhang, whether bowed or angular, although in some cases with but moderate overhang, a start may be obtained by using Phillips' bevelled edge saw. It is especially effective in vertical or horizontal angular deviations involving only a limited area of the septum. In such cases it is only necessary to push the long tongue shaped flap through the septum without fracturing it. It is not adapted to very thin or excessively thick septa; the former buckle and tend to return to the deviated position; whereas it is difficult and painful to saw through very thick septa, especially when containing bone. Also in thick septa, it is sometimes difficult to fracture the neck of the flap, in which case, this may be facilitated by incompletely incising it with Kyle's saw or Fetterolf's saw file.

In deviations extending far back into the bony septum, the posterior crus of the U-shaped incision is more effectively made with the saw through the wide nostril. Deformities located in the extreme posterior regions are better corrected by other methods. This also holds true in regard to sigmoid deflections, and those near the floor of the nose.

Deformities in the body of the flap or irregularities left in the formerly obstructed nostril, may have to be removed by subsequent

operation. It is well, however, to give nature a chance to adjust these spontaneously.

Since I first became acquainted with this method in 1897, I have used it in every deformity in which it was applicable, especially in "mixed" forms (3 cartilaginous and 20 mixed cases) with the most eminently satisfactory results. Contrary to the originator's experience, I found it very satisfactory in two cases of mixed deformity in children, owing to the simple after-treatment.

Case X. B. S. M., white, male, age 40; 1901.

Indications. Nasal obstruction, repeated colds in winter, especially in the larynx. Excessive smoker and drinker. Moderate arterio-sclerosis.

Type of deformity. Bowed cartilage to the right, smooth surface moderate overhang at nasal floor. Cause unknown.

Gleason operation, with saw and knife. Incision begun with bevelled saw. Cocain locally. Eucain injected. Duration. 10 minutes. Kyle-Mayer metal splint to prevent anticipated hemorrhage. Secondary hemorrhage, due to edge of splint catching in wound and preventing coaptation of edges.

Result perfect as to function and appearance, can scarcely detect site of operation.

Case XI. Dr. W. B. C., white, male, age 29 years; 1901.

Indications. Nasal obstruction left side, frequent colds and catarrh.

Type of deformity. Marked angular deviation of cartilage and bone (chondro-vomero-ethmoidal) to left side. Cartilage very thick. Cause unknown.

Gleason operation with saw. Difficult on account of septal thickness and development of bone in cartilage. Cocain. Duration, 15 minutes. No splint.

Result good. Slight synechia at floor in unobstructed side, no consequence. Septum too thick for this operation.

Roe's Operation (Trans. Amer. Laryn. Assn. 1900), consists essentially in the use of a special fenestrated forceps, by means of which either the cartilaginous or the bony septum may be fractured. Roe's forceps for a long time constituted the only safe and successful method of fracturing the bony septum, and my personal experience is limited to their use for this purpose, mainly as an accessory to some other method. Inasmuch, as even this instrument is not free from the possibility of danger, it has been suggested to control the line of fracture by means of preliminary fissure with the trephine or saw. Another resource is to use a male blade smaller than the one intended to go with the female blade of a given size. This instrument is especially useful in limited mixed deviations at

the chondro-osseous articulations. In my opinion no rhinologist's equipment is complete without it. I have performed this operation under cocain with satisfactory results and no complications.

Case XII. N. J., white, male, age 49 years; 1899.

Indications. Obstructed right nostril, pain over right eye, purulent discharge and frontal empyema right side; nervousness.

Type of deformity. Bowed deviation of face of ethmoid, completely concealing the middle turbinate on right side. Defective drainage.

Roe operation. Perpendicular plate of ethmoid fractured under cocain and forced over, no incisions, owing to presence of pus, right middle turbinate resected. Irrigation of frontal sinus with catheter; cured in 13 months.

Case XIII. Miss O. Z., white, age 18 years; 1904.

Indications. Nasal obstruction on right side.

Type of deformity. Bowed deflection of cartilaginous septum to the right, with angular vertical deflection at chondro-ethmoidal junction.

Douglass operation combined with *Roe forceps.* Two parallel incisions through cartilage, under cocain-adrenalin anesthesia, associated with crushing of vertical ridge with Roe's forceps guarded by saw incision (Kyle). Duration, 10 minutes. Dental gutta percha splint for 4 days. Result good.

Case XIV. Mrs. S. B., white, age 49; 1902.

Indications. Epiphora, mucocoele, pain in right nostril.

A lachrymal probe has been punched through the duct into the middle meatus.

Type of deformity. Angular deviation and crest high up at vomero-ethmoidal junction.

Operation. Saw incision and crushing with Roe's forceps. Resection of right middle turbinate. Operative result excellent. Referred to eye surgeon.

Kyle-Fetterolf operation (Laryngoscope, Aug. 1902) is more available as an accessory to other procedures, than a distinct method, although undoubtedly successful in certain cases of irregular and thickened septa.

Bosworth's and Krieg's methods differ merely in degree, the latter being an extension of the former. In each preseration of a flap of mucous membrane upon the convex side may be attempted.

Bosworth's plan of "sawing a new septum out of a thick and crumpled one, just like a straight board is sawn out of a crooked log" is applicable in cases of very thick septum.

Case XIV. Miss S. L., white, age, 17 years; 1902.

Indications. Double nasal obstruction; can breathe a little through the left side. Right ear slightly hard of hearing.

Type of deformity. Telescoped and thickened septum, deviated slightly to the right, caused by falling against a post in childhood. Roman nose, nasal bones convex. Left one incurvated to the right side. Depression beneath each one.

Operation. Resection of a slab from the septum with Bosworth's saw, below on left and above on right (bone) under cocain, at two sittings. Subsequent paraffin injection into external depression at two sittings (Harmon Smith method).

Breathing capacity and external appearance of nose greatly improved. Is now being catheterized for ear trouble.

Case XV. Miss A. G., white, age 17; 1902.

Indications. Absolute occlusion of left nostril. Hears loud voice only. About one year previously an unsuccessful operation was performed.

Type of deformity. Hypertrophied septum, with bevelled overhang low down in floor of nose. Cause unknown. Complete synechia between inferior turbinate and septum; not even a fine probe can be passed through left naris.

Operation. Krieg's "fenster" resection. An extensive fibrous synechia was first sawn through, and then an ellipse sawn bodily antero-posteriorly out of the cartilaginous and bony septum; the resected mass had to be removed piece meal with bone forceps. Simpson rubber covered splint used for four consecutive days. Uneventful recovery. Considerable improvement of hearing, immediately, not materially increased by subsequent catheterization.

The submucous operation should be defined as the removal of larger or smaller areas of the septum in between the muco-perichondrial and periosteal layers, and should not be applied to the mere preservation of larger or smaller shreds of soft tissues upon the convex side. It has been receently so fully and ably discussed by Killian, Hajek, Menzel, Jansen, Freer, Ballenger and others as to warrant but little further mention.

This type of operation is based upon the assumption that the septum is a mere partition and not a support of the external nose. I am not alone in believing that the last word has not yet been said as to the harmlessness of this procedure. While it may be feasible, personally I do not believe that it is indicated or justifiable, in all varieties of deformity, any more than the operations which have preceded it. At present it is being enormously abused. Final judgment cannot as yet be passed upon the method. It supplements the other methods, and constitutes an operative advance so great that the word "inoperable" may almost be removed from septal

terminology. I believe that ultimately it will be employed in these hitherto inoperable and other difficult cases, as well as in simple cases in which very limited resection is necessary. Extensive resection for the relief of minor deformities is indefensible.

My personal experience consists of 6 cases by the Killian and 9 by the Freer method. All of these were carefully selected cases of complex cartilaginous or bony deformities. All gave excellent results with the exception of a small perforation in 2 early cases. In my hands, the operation has required from 30 to 60 minutes, and both the patient and myself have felt the physical effects of the seance. I have performed two operations under general anesthesia by this method, one in a child and one in an adult. They were attended with such difficulty, that I shall hereafter resort to other methods when forced to operate under these conditions.

We have also another type of operation, performed externally, which is particularly applicable under general anesthesia; of these the simplest is that of HARRISON ALLEN. (A. A. Bliss. Trans. American Laryngological Assn. 1901.) This consists in severing the maxillary crest by means of a small chisel placed beneath the upper lip; the mobilized septum is then forced over with the finger and retained in position with a splint until it becomes fixed. The operation is usually done under light etherization, although it may be successfully performed under cocain injection. This operation is indicated in a well defined class where there is a displacement of the whole mass of the partition, so that its whole lower border rests on the floor of one or the other nostril. There is little or no curvature of the surface, but there is always more or less bending of the anterior nasal spine toward one or the other nostril, often combined with hyperostosis, so that the vestibular floor is converted into a narrow fissure. It is also very valuable as an accessory to other methods. (Asch, Douglass.)

Case XVI. Mrs. S. A., white, age, 28 years; 1900.

Indications. Nasal obstruction on right side, so that she had to hold the wing of the nose aside in order to breathe. Also external nasal deformity, consisting in a distortion of the tip to the left, a depression of the bridge to the right of the median line and a lump to the inner side of the tip, due to fracture of the upper lateral cartilage.

Type of deformity. Internally a translation of the septum to the right, dislocation from nasal crest with thickening at the nasal floor. Cause, a fall on the tip of the nose in childhood, and running against a door in the dark in adult life.

Harrison Allen operation. Ether. Uneventful recovery. Septum a little over corrected. Subsequent resection of lateral cartilage through the nose.

Löwe's operation is applicable in anomalies situated on the most anterior part of the septum. Under general anesthesia, best after preliminary Schleich infiltration of the septal mucous membrane, an incision is made through the mucous fold of the upper lip just above the gum, extending from the first molar of one side to that of the other, and clear to the bone. The soft parts are then separated from the bone, until the under border of the pyriform fossa is in view. The inferior and anterior borders of the cartilaginous septum are then denuded of the soft parts by means of shallow longitudinal incisions along the anterior nasal spine. The mucous membrane should not be perforated, as the whole operation should be extra-nasal. A raspatory, bent on the flat, is then inserted beneath the inferior turbinated body and from thence the lateral nasal wall, the nasal floor and the septum undermined. The nasal floor must invariably be first loosened, or else the mucous tube will inevitably be torn.

After elevation of the mucous membrane, the anterior inferior parts of the quadrangular cartilage are exposed, as well as the lower half of the apertura. Alterations in the anterior segment of the septum can now be removed as exactly as if one had before him, not the living man, but the skeletized skull.

With deformities lying further back and above, resection of the septum may be accomplished after preliminary decortication of the face. (See Löwe's Atlas.)

Case XVII. C. L., female, age, 10; 1905.

Indications. Mouth breather. Has had adenoids removed twice in three years, once by myself. Slightly deaf. Has repeated attacks of acute bronchitis. Is so nervous that she can scarcely be examined.

Type of deformity. Congenital nasal atresia. Extensive horizontal mixed ledge at nasal floor anteriorly, on left side.

Löwe's operation. Ether. Resection with saw chisel and bone forceps. Mucous membrane preserved. Considerable reaction, cold compress, gauze packing, cure in three weeks.

Another form of this operation is that used by GAUDIER. The patient being anesthetized with chloroform, the operator seated upon a high stool, takes the head between his knees with the face up. One assistant administers the anesthetic in the intermissions, and another illuminates and assists in other ways. The posterior nares are tamponned before-hand, and the nasal mucous membrane, both turbinal and septal, mopped with adrenalin. The lower border of the cartilaginous septum is then separated from the cutaneous, with a single horizontal cut of bistoury or scissors. The nares are

vertical and all maneuvers are made from above downwards. The lip is now forcibly retracted and a free incision made in the sublabial furrow, extending 1-¼ inches upon either side of the frenum. Bleeding vessels are seized and ligated at once; the wound is then retracted, and we see at the bottom of the lozenge shaped wound the two nostrils wide open, with the septum in the middle. Oozing is arrested by tamponnade. At this period an assistant replaces the operator in retracting the lip, and illuminates the field with an electric light. Beginning at the cut edge of the septum, you separate the mucous membrane with an elevator (Freer's instruments available), first from the concave side and then from the convex, until the entire deformity is denuded. The septum is then resected with punch forceps, until the deviation has been completely removed. If the nasal spine takes part in the deviation, it may be removed with gouge and mallet without any touble, and as far back as you please. The nose and lip are then replaced and sutured in position with catgut. The writer then inserts nasal splints and carries out the usual after treatment. The oral method permits general narcosis, a wide operative field and is applicable to all patients without exception. It is especially applicable to unruly children of any age. The technical difficulties of the oral method are fewer than in the submucous operation.

Every case of septal deviation is an individual one, and its correction a matter of individual study. Deformities vary from simple deflection to forms so complex as to defy description or illustration.

There are many methods of correcting these deformities, varying from a simple, single incision, to maneuvers so complicated as to deserve the name of plastic operation. The majority of operators combine the best features of each of these methods. To variable deformities must be adapted an equally variable treatment.

The simpler classical forms have already been fully described in considering the standard operations adapted to their correction.

COMPLICATED DEFORMITIES AND CORRESPONDING OPERATIONS.

Case XVIII. T. P., white, male, age 16; 1895.

Indications. Tip of nose turned to the left, bridge broad and left nasal bone displaced.

Type of deformity. Marked angular deviation of cartilaginous septum to the right; dislocation from nasal spine and projection of edge of dislocated cartilage into left nostril. Denies any injury. (Fig. 2.)

Gleason operation combined with resection of projecting ledges gave excellent results. In a marked case of this type, I should probably now perform a submucous operation.

Fig. 2.

Case XIX. W. J., white, male, age 17; 1898.

Indications. Nasal catarrh. Constant nasal obstruction on the left side. Left ear dull. Sense of smell impaired on left side.

Type of deformity. Septum deviated to the left above (bowed) and right below (angular). (Fig. 3.)

Fig. 3.

Operation. Roe forceps controlled by incision with a saw. This is a typical deformity for correction by the submucous method.

An unusual type of deformity is where we have a deep pocket upon the concave side, which may be either funnel or cup-shaped, and a corresponding conical or spheroidal protuberance upon the convex side, just as though the cartilage were embossed. (Fig. 4.)

Fig. 4.

There is much redundant tissue, and its correction is difficult. By sawing off the apex of the prominence, followed by knife incisions on the Asch, or Douglass' principle, the deformity can be corrected, but much judgment is required.

Case XX. W. P., white, male, age 12; 1903.

Indications. Feeling of suffocation, mouth breather, nasal speech, inattentive, adenoids.

Type of deformity. Spheroidal protuberance of cartilaginous septum to left; cup-shaped hollow on right side.

Operation. Adenoid removed. Incision with knives and replacement with finger under chloroform. McKernon splint, removed on fourth day.

Result reported to be good by patient's physician.

In the majority of cases, the submucous would be a better operation for this type of deformity.

A type of deformity that has not received the attention that its frequency warrants, is separation of the cartilaginous plates of the septum. We may have simple projection of the lower edge of the cartilage ("pyramidal" dislocation), single or double, or "flaring out" of its entire surface on one or both sides. Again there may be a protrusion of the plate on one side, bowed or angular, and a flaring on the opposite side; or both plates may be bellied out into each nostril, the intervening space remaining as a hollow cavity or becoming filled up with fibrous tissue (biconvex or spindle shaped). This variety is often seen in the noses of Hebrews, in which the septum occupies the whole nasal chamber. Multiple incisions (Kyle-Fetterolf) and compression, followed by splints, will correct moderate degrees of fibrosis. The submucous operation is not suited to this form; the Ballenger swivel knife will not straddle the redundancy, nor the Freer knives penetrate it, nor the Grünwald forceps cut through it. Probably the best procedure is to saw out the deformity en bloc, either by Bosworth's or Krieg's method (which see). We should endeavor to preserve the mucous flap if possible. The thickened form may present an even surface, or the cartilage may be telescoped and crumpled, giving it an extremely irregular surface. The term "bullous" or "vesicular" should be reserved for this curved separation of the plates, inclosing a distinct interspace or cavity.

Case XXI. E. G., white, male, age 13; 1906.

Indications. Nasal obstruction, most marked on right side. Under developed.

Type of deformity. Vesicular bowed deviation of cartilaginous septum to the right, separation of plates, left plate projecting into right naris below. (Fig. 5.) Caused by a fall upon the nose, four years ago.

Operation. Ballenger-Freer submucous resection of both plates, duration 45 minutes.

Result excellent, sent home in two weeks practically well.

Fig. 5.

Case XXII. W. E., white, male, age 14; 1904.

Indications. Complete nasal obstruction on right side. Dullness of hearing, discharge at times, not at present.

Type of deformity. Vesicular bowed deflection of right septal plate completely closing right naris; (Fig. 6.) due to a fall upon the nose.

Fig. 6.

Operation. Freer's (old) submucous resection of right septal plate under cocain, left plate left intact. (My first submucous operation), duration 30 minutes. Adenoid removed.

Result excellent, patient sent home in one week almost well. Gained 10 pounds in weight in a few weeks subsequently.

Case XXIII. R. G., white, male, age 50; 1906.

Indications. Dull pain at root of nose. Complete nasal obstruction at all times on left side. Repeated head colds. Excessive nasal discharge.

Fig. 7.

Type of deformity. External nose deflected to right, left nasal bone incurvated to right. Complex deviation of cartilaginous septum to left side, concave on right side. Left septal plate separated, with an anterior and posterior vertical angular dislocation and a superior and inferior horizontal angular one, terminating abruptly

above nasal floor (overhang) (Fig. 7); entire deviation can be circumscribed with a probe; caused by a fist blow in boyhood.

Operation. Freer (improved) submucous resection of both plates, cocain, mop and infiltration ½%. Duration 45 minutes. Recovery in three weeks. Result excellent.

Some deformities are so complex and the operations for their relief so intricate, that they deserve to be classified among the performances of plastic surgery.

Case XXIV. A medical man, 23 years of age; 1901.

Indications. As the result of a football injury some years before he presented complete nasal occlusion on the right side and consecutive postnasal and tubal catarrh.

Type of deformity. The septum had been fractured horizontally into the bony septum; the upper segment completely separated from the lower and carried into the opposite nostril, where it became embedded in hyperplastic material and adherent to the floor of the nose. The right surface of the triangular cartilage presented

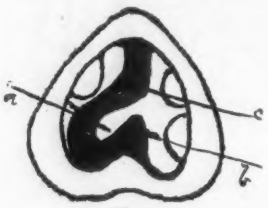

Fig. 8.

almost vertically at the right nostril. A fine probe could scarcely be inserted between the cartilage and the lateral nasal wall. A vertical ridge one-half inch in height, ran antero-posteriorly along the floor of the nose, consisting of bone with a capping of cartilage; between this ridge and the septal plate was a deep pocket on the concave side. (Fig. 8.)

A modified Gleason operation was done under local anesthesia (cocain 20% mop, eucain 5% by injection) and adrenalin, and was almost painless and bloodless; duration about 1-½ hours. The vertical ridge (b) was first denuded; then with a saw and knife, a modified Gleason U-shaped flap was made, (a) consisting of bone and cartilage and forced over this ledge into the opposite nostril, To lessen the resiliency of a much thickened septum, a horizontal groove was cut in the neck of the flap along its greatest convexity (c). No splints were employed, ice compresses. Considerable post-operative hemorrhage ensued, causing some worry, which yielded, however to continued cold. After two days rest, convalescence began and continued without event.

After recovery a vertical ridge was seen in the right nostril posteriorly, at the point of section, which was easily removed with cutting forceps, about one month after the first operation. There is considerable redundant cartilage in the floor of the right nostril, but as respiration is free and the ear can be satisfactorily treated, no further operation is contemplated. Previous to these operations a submucous cauterization had been done on an hypertrophied left inferior turbinate.

In this same category belongs a case of extreme displacement of the nose reported by Mayo Collier.

Case XXV. The dislocation of the external nose was extreme, the tip being under the right eye. The left nostril had been occluded for fourteen years, and very little air entered the right. The septum was pushed over to the left side, and literally lined the outer wall of the left nasal fossa. The right cavity was correspondingly enlarged, and a very large lower turbinal body occupied the concavity of the septum. A fine keyhole saw was forced into the lower meatus and the ridge of the maxillary and palate bones divided and removed. The vertical plate of the ethmoid bone was then fractured and pushed over to the opposite side. Some of the cartilaginous septum was removed.

The result was, so far, all that could be wished, a nearly straight nose and ample nasal respiration. No splints or supports of any kind were used.

In my judgment neither of these cases was suited to the submucous operation.

A difficult deformity to correct consists in a marked spur or ledge (chondro-exostosis) in the region of the nasal spine, associated with mixed deflection. This is in contact with the external nasal wall and almost in contact with the nasal floor.

The insertion of any instrument around the deformity is impossible and the growth is too dense for the use of forceps.

The use of mallet and chisel associated with the supra-labial operation, seems most feasible. The only case that I have had, was for special reasons treated by Löwe's operation.

CONCLUSIONS.

Modernization rather than abandonment of the older methods is what is needed.

The majority of cases can be satisfactorily treated by short operations under cocain-adrenalin anesthesia, and this should be employed whenever possible. The use of cocain admits of exactness in placing a limited number of incisions with adaptable instruments, under visual inspection, in the location where they will be most effective. Success depends more upon thoroughness and exactness in making these primary incisions than any other element.

One of the most valuable contributions of the submucous operators has been the demonstration of how much the patient can stand under cocain anesthesia. The general surgeon too, having learned from us the skilled use of this agent, is now showing us its great possibilities. For instance, removal under Schleich infiltration anesthesia of the hyoid bone, part of the base of the tongue and of the pharynx, as well as the larynx, recently performed upon a patient of mine.

When skillfully applied and carefully guarded by adrenalin, strychnine or alcohol, strong solutions of cocaine or even the pure powder may be safely used. By selecting our patients with discrimination in regard to their physical and nervous stamina, and employing the semirecumbent position, much of the supposed toxic effect of cocain may be avoided. I always prepare my cocain solutions fresh for each person, by dissolving tablets in warm sterile solution of adrenalin 1-2000, contained in a graduated minim flask, so that the exact quantity used can be determined.

The simple deviated septum operation is practically painless under cocain anesthesia. In difficult cases, all the preliminary incisions should be made under cocain, and the painful part (use of forceps, etc.) done under light general anesthesia. Ethyl chloride would seem an ideal anesthetic for this purpose, on account of its safety, rapidity of action, and its eschemic effect upon the nasal mucous membrane. After its use it is necessary for the nose to be plugged, for fear of secondary hemorrhage. Prolonged general anesthesia is now seldom required in these cases.

If we should pursue the standard operations with the same assiduity and pertinacity as the submucous, aiming at *improved technic* and *increased skill*, we should obtain in properly selected cases, by these less severe and exhausting methods, results in no sense inferior to those obtained by the submucous.

The trend of operative improvement should be toward simplification of technic and shortening of duration, rather than toward complexity. All obsolete and unnecessary instruments or maneuvers should be eliminated. In a large percentage of cases the use of forceps, either as a crushing or a compressing instrument, is ineffectual or unnecessary.

Fracture and replacement with the finger is efficient and painless, when the incisions are made completely through the cartilage. Therefore, this, the most painful step of the septal operation, can often be omitted. In certain cases, incision of the nasal spine with a chisel, either through the nose under cocain, or by the supra-

labial method of Harrison Allen, is an efficient substitute for their use.

The use of splints is extremely objectionable and should be abbreviated or eliminated whenever possible. When the primary fracture is thoroughly done, especially if the nasal spine is fractured or incised, splints will be required for but a short time. Having used all varieties of splints, I have latterly empoyed selvidge-edge, strip-gauze, or Simpson-Bernay's compresed cotton, dusted with bismuth or saturated *in situ* with camphormenthol solution in albolene, which will remain in the nose several days without becoming foul.

We now have a number of time-tested and successful operations, each one especially adapted to one or more of the infinite variety of deformities. It is a mistake to claim that every operation will correct all varieties. Operations must be selected and adapted to individual deformities, and it is often a difficult matter to decide which operation is best in a given case. I believe that success is as much dependant upon good judgment in this respect, as on marked operative ability; here the tyro fails.

If there be any excuse for specialism in nose and throat work, it is surely in the line of septal orthopedics. To successfully treat these cases, one must possess a special mechanical ingenuity and dexterity in endonasal technic, both in operating and in after-treatment, that can only be acquired by constant practice. It is a specialty within a specialty; one must not only be a specialist, but an expert in this particular line of work.

Quickness in operating develops with experience, and I am sure that as skill and facility increase, these operations can be made less formidable and more satisfactory.

There is no line of work in which the adage "practice makes perfect" is more applicable than to septal deformities; it is significant that the originators of these operations all claim better results from them than others obtain, and that all operators report their accidents or failures mostly in their early cases. We must moreover become expert in several methods, as we may have to combine one with the other (Douglass-Roe; Roe-Kyle; Douglass-Allen, etc).

I, for one, am not willing to relinquish operations by which I am able to obtain satisfactory results in suitable cases in 5 or 6 minutes actual operating time, in favor of those requiring from 6 to 10 times that long and much endurance on the part of both patient and operator. Moreover, we will find many more patients who can endure the limited strain of these short operations than the prolonged strain of the submucous.

As to which of these methods have stood the test of time and experience, and which can be discarded as superseded by better methods, each is entitled to his individual opinion. I venture to assert, however, that the Asch, Douglass, Gleason and Harrison Allen methods, and the Roe forceps and Kyle saws and splints, will continue to be used in suitable cases, as long as there are septal deviations to be corrected.

Dissatisfaction with the new method is already appearing, and I am sure that in a short time there will be a reaction in favor of the older operations, and that in some cases, a better result can be obtained by the old methods, than by the new. Although the submucous operation belongs to the most difficult of nasal operations, all agree that it is indispensible, and a method that every one who aspires to the title of a modern nasal surgeon must master.

The writer is fully aware of the incompleteness, imperfection and possibly the incorrectness of these views, but this has seemed to him to be a direction toward which our attention might profitably be turned at this time.

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BIBLIOGRAPHY.

1. Asch, M. J. Treatment of Nasal Stenosis due to Deflective Septa. The Laryngoscope, June, 1899.
2. Ballenger. *Ann. of Otol., Rhinol. and Laryngol.*, June, 1905; also *Penna. Med. Journ.*, March, 1906.
3. Bosworth, F. Diseases of the Nose and Throat, Wm. Wood & Co., New York, 1896.
4. Collier, Mayo. Extreme Displacement of Nose. *Journ. Laryngol.*, London. January, 1903.
5. Douglass, H. Beaman. Septal Fallacies. The Laryngoscope, 1903.
6. Douglass, H. Beaman. Nose and Throat Surgery. F. A. Davis Co., Philadelphia, 1906.
7. Fetterolf, Geo. A Simple Method of Correcting Certain Deformities of the Nasal Septum. The Laryngoscope, August, 1902.
8. Freer, O. Trans. American Laryngol. Ass'n, 1905.
9. Gaudier. Traitment des deviations de la cloison nasale. Resection sous muquese par la voie sous labiale. *Rev. Hebd. de Laryngol., etc.*, No. 40, 1905.
10. Gibb, J. S. Deviation of the Nasal Septum. A Review of 100 Operations for Correction. Trans. Sec. Laryngol. American Med. Ass'n, 1904.
11. Killian. *Ann, of Otol. Rhinol. and Laryngol.*, June, 1905.
12. Krieg. Atlas. F. Enke, Stuttgart.
13. Kyle, D. Braden. Diseases of the Nose and Throat. W. B. Saunders Co., Philadelphia, 1904.
14. Lowe. Zur Chirurgie der Nase. Verlag O. Coblentz, Berlin, 1905.

15. MAYER, EMIL. Deviation of the Cartilaginous Nasal Septum; Its Cure. *New York Med. Journ.*, 1895; also Trans. New York Acad. of Med., 1898; also Trans. Sec. Laryngol. American Med. Ass'n, 1903.
16. MACKENZIE, J. N. Abuses in Intra-Nasal Surgery of Today. Trans. American Laryngol. Ass'n., 1904.
17. MOURET, J. De la resection sous muquese du squelette de la cloison nasal devie. *Rev. Hebd. de Laryngol. etc.*, No. 43, 1905.
18. RICHARDSON, C. W. Trans. Am. Laryngol., Rhinol. and Otol. Soc., 1898.
19. ROBERTSON, CHARLES M. Observations on Different Forms of Operation for the Correction of Septum Deformities. *Chicago Med. Record*, 1905.
20. ROE, J. O. The Correction of Deviations of the Nasal Septum, with Special Reference to the Use of the Author's Fenestrated Comminuting Forceps. *New York Med. Journ.*, April 13, 1901.
21. SEMON, SIR FELIX. Some Thoughts on the Principles of Local Treatment in Diseases of the Upper Air Tract. The MacMillan Co., New York, 1902.
22. SMITH, HARMON. A Consideration of Septal Spurs and Deflections. *Internat. Jour. of Surg.*, December, 1904.

Photo-Therapy in the Treatment of Otitis Sicca. DR. MANGIOLI. *Archiv. internat. de laryngol.*, May-June, 1905.

Light possesses in addition to its bactericidal action stimulating properties which induce acceleration of functions and organic changes and which benefit the life and energy of the organs. It is on this property of light that the application of photo-therapy in otitis sicca is founded. The author has adopted the style of lamp used by Ferreri for the larynx and the results which he has obtained seem encouraging.

SCHEPPEGRELL.

THE CLIMATIC TREATMENT OF TUBERCULOSIS OF THE UPPER AIR TRACT.*

BY WOLFF FREUDENTHAL, M.D., NEW YORK.

It is an old and common experience that the majority of pathological conditions are beneficially influenced by pure, fresh air. More difficult, however, is the answer to the question, "In what affections can a marked relief or cure be expected by a change of atmospheric surroundings?" The disease of interest to us in this discussion is tuberculosis of the upper air tract. Since we cannot separate those parts from the rest of the body, we should not ignore the condition of the lungs, which as a rule, are also affected. On the other hand, it is my conviction, based on a considerable experience, that the diseases under consideration require a special climate in some instances.

First of all, it must be borne in mind that tuberculous cases are being cured in all parts of the world, i. e., in every possible climate. Still the difference, for example, between a high altitude and the sea shore is so great, in a physiological sense, that in pathological conditions a beneficial or a deleterious influence might be expected from either of these localities; and, as a matter of fact, such influence for better or worse does exist under different climatic conditions, for you will all agree that some of your patients have done well in southwesterly altitudes, while they become worse when they return to their homes in the east. Why is it that these relapses occur so frequently? Is it because these people resume their old occupations? No! Some of them—women—have no vocation, while others follow their business in the west for many years without detriment. This is undoubtedly due to the influence of the climate, and in the following pages it shall be my aim to discuss briefly the treatment of tuberculosis of the upper air tract from a climatological view point.

For the sake of convenience, I have thought it best to divide the subject into four parts: (a) Aerotherapy, (b) Heliotherapy, (c) Altotherapy, (d) Thalassotherapy.

(a) *Aerotherapy* is the treatment with fresh, pure air, which *a priori* we should be able to utilize everywhere, and in fact we do make use of it all over the world. What diet means in catarrh of the intestinal tract, aerotherapy means in catarrh of the air pas-

* Read before the American Laryngological, Rhinological and Otological Society, Kansas City, June 11, 12 and 13, 1906.

sages (Nothnagel), or, we may add, in tuberculosis of the air passages. If we take a patient away from his sweat-shop, direct him to do half a day's work if he cannot give up work entirely, and let him spend as much time as possible in some park in the open air or, in smaller towns, in the fields, such a patient has actually changed his climatic surroundings. If necessary, his throat and nose can be treated at the same time, and in a number of cases we will be rewarded by a cure.

If the patient is somewhat better off and can stay away from business for several months, so much the better for him. We can then place him in a sanatorium nearby, or he can present himself at regular intervals for treatment. By far the great majority of all consumptives must be treated in that way, and I am sure there is not one physician in the United States who has not obtained cures in that manner.

The details of using air as a therapeutic means in tuberculosis are so well known that I need not dwell on this topic any further. However, let me ask you not to go into fads. The following case may illustrate what I mean:

A well-nourished gentleman commenced to cough, and a diagnosis of incipient tuberculosis was made. Consequently he was ordered by his physician to stay in bed on a strict diet, to be massaged three times a day, and directed to have a tent built on his house opposite Central Park, in order to obtain more fresh air. These orders were carried out strictly for a week, when this gentleman and his wife were so exhausted from excitement, worry and lack of sleep that they told me they could not stand it any longer. On my examination the condition of the lungs gave a reasonable doubt as to the correctness of the diagnosis, but there were present marked pharyngitis and laryngitis. I told the gentleman to eat whatever he wanted, to be out all day long, and to have his throat treated. After eight weeks he had gained ten pounds in weight, and, having settled his business affairs, I sent him to the mountains. His cough had left him long before. I am convinced that this patient would have gone rapidly into consumption if the former method of treatment had been continued.

It is very true that a consumptive cannot get too much fresh air, but to *suddenly* transplant a person susceptible to drafts from a hot room in New York City to cold winter air day and night is irrational, to say the least. On the other hand, even in the best of climates patients often do not get enough air. Some people think that when

they live in the open air while taking the rest cure, they have done enough. As you know, however, the gaseous exchanges are only partly carried on by the lungs, and a great deal is done by the skin. Hence we ought to expose the skin as freely as possible to the air since parts of the lungs are out of function anyhow. A sojourn out-doors brings one in contact with the movable air, which is an essential factor in stimulating the skin, and through it the organism, to renewed activity. This is also the reason why we should accustom our consumptives slowly to wearing as few garments as possible, and finally to take air baths with the naked body. With this we have reached the second part of our discussion.

(b) *Heliotherapy.* The therapeutic use of the rays of the sun is older than medicine, but their action on the human organism has been explained scientifically only in late years. I need but mention the names of N. R. Finsen, W. Gebhardt, Möller, and Schönenberger, and they will bring to your memory a great deal that has been achieved in that field.

While the direct rays of the sun have been chiefly employed in order to promote perspiration, nowadays a combination of the *diffuse* sun-rays, with exposure of the naked body to the air is being utilized with success. By exposing the whole body to the air, not only is the exchange of gases through the skin accelerated, but at the same time, through the action of the sun, the metabolism is increased, and finally a beneficial influence is exercised upon the nervous system.

Says Prof. Rieder of München: "The question has been brought up whether it would not be preferable to let the patients go around naked in glass houses, instead of subjecting them to the fresh-air cure, as is customary in sanatoria. This question has been answered in the affirmative by others, and I am personally very much in favor of such a combination, only I should advise that this cure should be carried out in the open air instead of in glass houses, as Rieder suggests[1].

That we can also use the direct rays of the sun for this treatment, I have mentioned on various occasions. Permit me only to repeat that one of the first directions I give to my patients is to stay in the sun as long as they possibly can—that is, in winter. In summer they are advised to rise with the sun and expose themselves to its rays. In warm climates, as well as in our own, this has to be done later in the day with more care and judgment. But even in the hot

1 Handbuch der physikalischen Therapie von Goldscheider & Jacob, Bd. ii, p. 502, etc.

regions of Colorado, New Mexico, and Arizona I have had patients working on ranches for many hours every day and they fared well. But not everybody can stand this, and we have to discriminate here as in everything else in medicine. We should remember that exposure to the sun does not act therapeutically through its intensity, but rather through its continuity. Too much exposure has a weakening, deleterious effect, and spoils the appetite, but taken in the right way it has done good in a general way. As to treatment of the upper air tract, I have noted *some* good effects in so far as relief of pain is concerned. As a substitute for the sun the arc light has been used, and while it is not a panacea it is nevertheless a good adjuvant to our armamentarium in such treatment.

(c) *Altotherapy.* I have coined this word myself, at least I do not remember having read it anywhere, to indicate treatment in high altitudes. This treatment is of great, if not of paramount, importance to our tuberculous patients. There are four features which characterize high altitudes.

1. The pressure of the air. This being highest at the level of the sea gradually diminishes with the altitude, and with it likewise the density of the air. ,

2. The intensity of radiation of the sun. This (i. e., the rays of heat), on the contrary, increases with the altitude and independently of the heat of the ground.

3. The rays of light. Their intensity is also increased and, according to Prof. A. Loewy of Berlin, it is especially the chemical short-waved rays, the blue and violet, which are present in high altitudes and make themselves felt more strongly than at the level of the sea.

4. The temperature of the air. This diminishes with the elevation. Of course that varies with the geographical latitude, and is due partly, as we know, to the decreasing density and diminished humidity of the atmosphere.

Now these atmospheric conditions prevailing in high altitudes have a more than merely perceptible effect on the human body under normal conditions. Can we believe that they are negligible in pathological processes? We know that good work is done in sanatoria situated at the sea level, but does this imply that climate as a factor in the treatment of tuberculosis can be ignored entirely? If our home sanatoria were less careful in selecting by preference incipient cases or such where the diagnosis is still in doubt, one would see how quickly the mortality would rise. I, myself, have

advocated the erection of sanatoria in and near New York, and I know that for cases with slight local lesions, cases which are quite well-nourished, they fill a great need. On the other hand, cases with marked anaemia, febrile temperatures, and irritations of the mucous membranes do much better in the mountains. This is also the experience of A. Fraenkel of Berlin[2].

Patients with much expectoration from the lower or upper air tract should be sent to a dry climate; while others, with a dry hacking cough, do better in a moist climate.

In most of the text books, it is stated that tuberculosis of the larynx or pharynx is a contra-indication to a sojourn in high altitudes, as it is a complication of pulmonary tuberculosis that retards or prevents the cure of the latter in these altitudes. Such and similar statements go from one text book to another and are accepted as truth. They are certainly not in accordance with my experience. Among my patients there are some now living in New York City in good health and following their occupation for the last five and even ten years, who have been suffering from pulmonary and laryngeal tuberculosis (one with deep ulcerations in the lung). They were sent by me to Denver, Colorado Springs, parts of Arizona, and New Mexico, and were perfectly cured there in spite of their laryngeal affection

The trouble is that a great many of these cases represent an advanced stage of the disease, with a derangement of one of the vital functions of the body, namely, digestion. I say digestion purposely. The tuberculous involvement of the larynx only in extremely rare cases interferes with breathing, i. e., with the respiratory tract; but too often when dysphagia is present it interferes with nutrition. Now to send to a high altitude a patient who has been debilitated by lack of food, whose heart is fluttering with every movement, and who has not sufficient vitality to become acclimated to the new surroundings—that is like stretching a piece of rubber to see whether or not it will break.

On the other hand, there are quite a number of those afflicted with laryngeal tuberculosis who have enough vitality and energy to become accustomed to new surroundings, whose hearts will do the somewhat increased work without any damage, and whose dysphagia can be kept under control. Many of these will derive a great deal of benefit from a stay in high altitudes.

Persons suffering from dysphagia should be sent to some place where there is a laryngologist who knows how to handle such cases.

2 Lungenkrankheiten, Berlin, 1904.

It is not at all to the credit of some sanatoria that they neglect the treatment of the larnyx almost entirely, and it is not a rare exception for a patient to complain of pain in his throat and be told that he has a cold. It is true that we cannot cure all these cases, but it is only a short time ago, while I was preparing this article, that a patient came back from a well-equipped sanatorium in the mountains because no attention had been paid to his throat. He had ulcerations on the epiglottis and on one vocal cord, besides infiltrations of the other cord, and inter-arytenoid spaces. By local applications these ulcerations soon healed, fortunately, and the patient could take his food without the slightest difficulty. Then I sent him back to the mountains. The infiltrations are there yet and he is hoarse, but that does not bother him. He has better chances for a cure now than before.

Cases of tuberculosis of the upper air tract in many instances not only require high altitudes but often also a mild climate. This is another fact that apparently has been forgotten of late. A wind blowing at the rate of 40 or more miles an hour is not good for many of our patients with involvement of the upper air passages. They have been compelled to return from some well-known sanatoria in the Catskills and Adirondacks and have done better in some of our southwestern states. It is remarkable how much cold and how much wind some patients can stand, but there is quite a proportion who cannot stand this, and they do better elsewhere.

Robert Levy of Denver[3], who has an exceptionally large experience in this field, attributes much therapeutic effect to the climate of Denver. In his statement others apparently agree with him, as for example, George L. Richards of Fall River, Solly of Colorado Springs and William Duffield of Phoenix, Arizona. I have reported my observations on the climate of the southwest some years ago[4], and still hold the same views, believing that some persons will do well out west who have no chance of living in our New York climate.

(d) *Thallassotherapy.* This is the treatment of patients by means of sea baths and sea air. The first will not be discussed here, since enough has been written on that subject in general. I would only add that tuberculosis in my experience is no contraindication to sea bathing. The same holds good for tuberculosis of the upper air tract, with but one exception, viz., when the salt water produces an irritating cough. In such an event it should not be allowed: but I must say that these cases are rare and that many patients take sea baths with good results when they are careful not

3 THE LARYNGOSCOPE, p. 763, 1902 and *Journ. Am. Med. Assn.*, p. 707, Sept. 16, 1899.

to swallow too much water. Bathing and swimming have to be regulated as any other exercise on land. Too much of it may do harm, while if moderately taken and increased slowly it may do and has done a great deal of good. After the bath the patient should react quickly and soon feel warm. If he is blue after coming out and a comfortable feeling does not set in promptly, sea baths should be prohibited or postponed until he is stronger.

The treatment of inhaling sea air. This is one part of our therapeutics that has been neglected in the United States until almost this day. When years ago I sent patients with tuberculosis *in winter* to Coney Island and neighboring places, one of our best-known laryngologists made fun of it. Nowadays we have already advanced so far that we have a sanatorium for sick babies there, and it is doing good work.

And why not? I ask. This section, i. e., the southwest shore of Long Island, is to some extent protected against the cold north winds of the winter. If the sun is out with a south wind it is much warmer there than in the city, and the patient is able to obtain the great benefit of the sun, and absolutely pure sea air. Is that not doing a great deal to stimulate the organism to renewed vitality?

Another point is sea voyages. It is more than strange that we who are surrounded by water have not thought more of sea voyages as a means of restoring health. But it is perhaps that the nearest and most natural is overlooked. *Lucas a non lucendo.* The English have a large experience in that respect, and lately such a place has been proposed in Germany also by Nisser, v. Leyden. v. Bergman and Sobotta. I believe that such floating sanatoria would be of great benefit to our consumptives in this country, provided that vessels are built with all the conveniences and sanitary arrangements necessary for the care of such patients. A great deal of good could be done to quite a number of sufferers, provided they are selected with proper care. Such floating sanatoria could be used easily in the vicinity of New York during the summer months.

In conclusion, I would emphasize strongly the necessity of giving our tuberculous patients the benefit not only of medicinal and surgical but also of climatic treatment. If after thorough trial a patient does not do well in one climate, he should be sent to another. But do not let us become pessimistic after having tried one specific kind of climate or treatment without success. Whatever be the method of treatment, the physician must always maintain a spirit of optimism which will be an inspiration to himself and the patient.

1003 Madison Ave.

IS IT NECESSARY TO OPEN THE ANTRUM IN EVERY CASE OF MASTOID OPERATION?*

BY GEO. F. COTT, M.D., BUFFALO, N. Y.

Mastoid operations are performed by the surgeon, ophthalmologist, otologist, laryngologist and the general practitioner. When done by these promiscuous gentlemen (excepting the otologist) it is nearly always for acute mastoiditis. This paper deals with the acute variety only and therefore comes within the province of all physicians. After acute suppuration of the middle ear, there will be pain in the mastoid region with or without swelling. Pain is commonly present especially upon pressure over the region of the antrum or at the tip of the mastoid process. When there is great infiltration over the mastoid, there is no doubt of periostitis and an incision may find pus present. In such case it is always good surgery to open the cells. If pain is constant and severe, especially after grippe or other zymotic disease, the cells must be opened and if no pus is found superficially, it is necessary to penetrate to the antrum where it will surely be discovered. This differs very much from chronic cases. If pain is constant, deep seated and severe, often radiating over the side of the head, pachymeningitis or epidural abscess may be the case. Another class of cases requires very different treatment. When the patient comes under observation, his physician will tell you he had acute middle ear inflammation with suppuration, but the discharge stopped several days ago, since then however he has had considerable pain over the mastoid process with swelling over a large area of scalp. You examine the ear and find it quite dry; perhaps an opening still in the drum head. Again, when a patient has gone for six or eight or ten weeks (as I have recently noticed in two cases) with a great deal of pain, requiring quantities of morphine to give sufficent relief for a limited amount of sleep, the destruction of bone may have involved the inner table of the skull and then have lead to intra cranial mischief. In the larger cities these results are hardly ever seen; but in our smaller towns, I am sorry to say, they are more common.

Occasionally in a mild case suppuration has ceased for some days then swelling begins behind the ear, pain at first is troublesome

* Read before the Eleventh Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, St. Clair, Mich., August 30, 31 and September 1, 1906.

but after a few days subsides, however, remaining tender. You make an incision over the mastoid and find pus in varying quantities, usually in large amount; you then apply a sharp spoon and clean off the skull above and back of the ear, and your patient will promptly get well without opening the mastoid cells. When, on the other hand, the pain is deep seated and constant often at the tip of the mastoid with a large amount of infiltration, pus may be found under the scalp; but in addition, however, the cells must be opened where pus is invariably found. You now clean out the large cells until all the pus and debris is removed, then probe for those cells leading to the antrum and if a solid wall is found shutting off the antrum from the cells or the cells external to the antrum are found dry and healthy your operation is complete and the wound is packed with iodoform or subiodide of bismuth gauze. The patient will recover without opening the antrum. The procedure must be left entirely to the wisdom of the operator. Some surgeons will open the antrum in every case believing the operation never complete without. When mastoiditis occurs after the middle ear has recovered the antrum will usually be found dry also, in fact, probably has never been involved at all because the infection passed out of the middle ear by way of the periosteum, sheaths of vessels or more probably through the cells external to the antrum, between meatus and the middle ear. These cells are found in a certain percentage of skulls. If this anatomical possibility is kept in mind it may save the practitioner considerable anxiety and some difficult manipulation deep in the temporal bone.

One thing I think ought to be particularly cautioned against and that is a Wilde's incision for the purpose of evacuating pus without ascertaining what other important symptoms are present, such as fluctuating temperature, irritability and restlessness, chilly sensations, deep and radiating pain over side of head, very sensitive scalp on side of ear affected, etc. If these symptoms are overlooked and the physician's attention concentrated entirely on the apparent mastoid disease, his patient will quickly succumb to the deeper lesion within the skull.

It may be a very good thing for the practitioner to be self reliant: but when he sees a patient gradually growing worse it is more to his credit to seek consultation than to lose the confidence of patient and friends. It may also be noted that the patient's statement cannot always be relied upon for I have found in several instances where the patient claimed a first attack, the middle ear manifested old destructive trouble long forgotten.

This paper was prompted by several writers claiming that in every instance of mastoid operation the antrum should be opened to insure a good result. I think I differ as you have noticed in my foregoing remarks. Nor do I stand alone in this matter. Dr. Max Kaiser several years ago read a paper before the Academy of Medicine of Buffalo relating three cases in which he did not find it necessary to open the antrum to get a complete recovery. Professor Doctor Stetter in the *Berliner Klinische Wochenschrift*, No. 38, 1899, antidating us by several years, says it is still a mooted question whether always to open the antrum. The following cases will speak for themselves:

Case I. Man, age 40, brewer, working in a beer cellar where the temperature is always very low, was taken with pain in the ear one day, followed by discharge, which ran an ordinary mild course, and in about two weeks got well. After a few days he complained of pain behind the ear when he was sent to me. At the German Hospital he was anaesthetized and Wilde's incision made; pus was found under the scalp which was detached from the skull for four inches upwards and backwards. After curetting, the wound was packed and a bandage applied. The patient made an uninterrupted recovery.

Case II. Brewer, age 44, drank large quantities of beer, having a typical roseate beer face. Deep seated pain over mastoid behind the ear, lower than upper meatal wall. Previously he had had middle ear inflammation followed by discharge of pus, and recovered, the ear having been quite dry for several days. Mastoid cells were opened after cutting through an inch of infiltrated tissue, pus was found in lower cells, which were cleaned out. No communication was found with the antrum. Wound was packed and patient made a good recovery. In beer "guzzlers" an anaesthetic acts badly, for they do not go under it very well and sometimes not at all, and occasionally one dies from the effects of the anaesthetic a day or two later without any other assignable cause. In this case we first gave ethyl chloride and he was off in less than two minutes, when chloroform was substituted.

Case III. Italian, age 23, looks older. A patient of Dr. Julius Ullman, who asked me to see him at the German Hospital. He gave me a history as follows: Three days before the patient called on him to prescribe for a severe pain in the ear of but a few hours duration. The next day Dr. Ullman found the drum head bulging and punctured it letting out considerable serum which gradually

turned to pus. Pain was referred to the mastoid region when my attention was called to the case on the third day after its onset, which by the way was due to a mild attack of pharyngitis. I found a large quantity of pus in the external canal and considerable pain over the mastoid near its tip, but more over the antrum. The patient was immediately chloroformed and the mastoid cortex removed. Pus in moderate quantity was found in the lower cells right under the cortex. It was however thought advisable to clean out the mastoid and ascertain the condition of the antrum. No more pus was found but the cells were easily broken down. After cleaning out all the softer bone, I could find no antrum after very careful search. The mastoid was excavated as much as possible without injuring the deeper parts, but no antrum came into view. The wound was washed out, the canal likewise cleaned and both packed with iodoform gauze. The third day the wound was dressed; slight moisture was observed on inner end of the gauze. Patient felt good and improved rapidly.

Case IV. This was similar to case 2 with a like result and need be mentioned only.

I believe our text books make very little if any mention of this class of cases yet they occur every once in awhile and when recognized do not expose the patient to needless operation.

1248 Main St.

A CASE OF XANTHOMA MULTIPLEX, WITH INTERESTING THROAT COMPLICATIONS.*

BY JOHN EDWIN RHODES, M.D., CHICAGO.

This young man has exanthoma multiplex, or exantholasma, and the case is one of unusual interest to laryngologists, because of the involvement of the mucous membranes, with an almost complete occlusion of the larynx by the nodules, so that a tracheotomy has finally become necessary.

Xanthoma, let me state, is a perfectly benign neoplasm, of a fibro-fatty nature, deposited in the corium. In many cases it is confined to the eyelids, and a condition found in adult life. The multiplex form is rare, usually congenital when found in the young, sometimes hereditary, but when found in the adult is apt to be associated with chronic jaundice or glycosuria. Migraine is so frequently present that it is an important factor in the exanthoma pelpebrarum, and is also a factor in the multiplex form. Dermatologists recognize two forms, shown as either plaques or nodules, and in this patient we have the two beautifully shown. We have, also, the infiltrations as they appear on the mucous membranes. On the skin the patches have a deposit of pigment, giving to them a chamois-leather yellowish color, usually. This is well marked on the eyelids, here, but those on the body vary from a light yellowish and brownish color to that of a deep bronze. The patches on the conjunctiva of both eyes (an exceedingly rare condition) are also pigmented, but those in the mouth and larynx are not. The nodules involving the whole surface of the penis and scrotum are of a bronze hue. These neoplasms are not indurated and the plaques are raised little if any, above the surface of the skin, while the nodules are deposits of various sizes, from the millet seed to a bean or larger, sometimes coalescing to form distinctly tuberous masses. In all varieties they are soft and the skin is smooth and flexible over them. In this multiplex variety there may be a wide distribution of the process, and the eyelids, the chest, the arms, the palms, soles of the feet, the elbows, knees, knuckles, the nates and about the anus, the penis, the scrotum, the mucous and serous membranes, etc., may be involved. It is usually placed symmetrically on both sides of the body, beginning generally in the eyelid, preferably the left.

* Read before the Chicago Laryngological and Otological Society, May 1, 1906.

Crocker says "the process in the nodular variety is that of a connective tissue neoplasm in the corium. In the meshes of connective tissue lie epithelioid, fattily degenerated or infiltrated cells, or masses, derived from the connective tissue elements, with a deposit of yellowish brown pigment in the rete." He believes inflammation the primary feature, the xanthoma cells and the connective tissue growth being secondary, and that toxemia originates the whole process. Politzer believes the eyelid lesion altogether a different process from the nodular form, and considers it a product of degeneration of embryonically displaced muscle fibers. I do not believe that we have two distinct pathological processes in this patient, in whom we have both forms distinctly shown. Many sections have been made from masses removed from different sites, and they show similar conditions.

There is also an extremely rare condition, xanthoma diabeticorum, of the same nature but characterized by more inflammation and less connective tissue growth. All these cases recover.

History of Case. C. S., aged 18, was referred to me by Dr. S. W. Pietrowicz, in whose service he was in St. Mary's of Nazareth Hospital. He had been admitted to the hospital March 12th, 1904. At the time of his admission he gave the following history: His parents are living and in good health. One sister is living and well. At ten years of age he had a mild attack of measles. Two years ago he had an acute gastro-intestinal disorder, of brief duration. There is no history of venereal disease. He does not use tobacco or alcoholics. The appetite has never been good. The bowels are regular. His present illness began four years ago with itching in the eyelids, on the shoulders, penis and scrotum, which was much aggravated by scratching. This was at intervals only. The condition persisted for about a month, when he noticed an eruption, which appeared simultaneously on the eyelids, shoulders, penis and scrotum. This consisted of discrete papules, reddish in color. These gradually increased in number and size and changed in color to a dark brown. About two years ago, he began to be constantly very thirsty and to drink large quantities of water and to pass large amounts of urine. Eight months ago, spells of dizziness and faintness manifested themselves, lasting about two minutes, and occurring at intervals of two or three weeks. These attacks have steadily increased in frequency until, at the present time, he has several attacks in a day. For six months he has been hoarse. He says he has not grown perceptibly in the last four years. Two first teeth were extracted two years ago and the second teeth have grown very little since.

His condition at that time was noted as follows: He is very small for his age, but is fairly well nourished, and his color is good. The cheeks are rosy, and the skin is soft and delicate. The tongue is clean. He has a sensation of "lumps" in his throat, and during his attacks of dizziness he has a "sick feeling" in his throat. The cold water he drinks at these times does not seem to relieve his sensations. The pulse rate increases during these attacks to 100 or 110 per minute. His attacks are increasing in length and severity. The upper and lower eyelids have plaques varying in size from a pin point to a millet seed, somewhat confluent, of a glistening light yellow or bronze color. On the conjunctiva of the right eye is a patch one cm. by one-half cm., involving the sclerotic and the cornea. This

Fig. 1.

is a light yellow in color and gives rise to no discomfort. The left eye has two smaller papules of the same type. The conjunctival vessels are slightly congested. On the neck and shoulders are small patches very little raised from the surface, soft, confluent and discrete, varying in size from a millet seed to a split pea, of a brownish color. There is no induration and the skin is everywhere soft and delicate. There are a few of these spots on the abdomen. There is no hair in the axillae. A physical examination of the chest and abdomen shows normal conditions of the organs. The penis and the scrotum present large, smooth, dry nodules covering nearly the entire surface. The masses are made up of nodules varying in size from a split pea to a bean. Some small spots appear on the inner aspect of the thighs, the nates and about the anus. There

are none on the palms of the hands or the soles of the feet. The hair on the pubes is very fine and scanty. At this time he was brought to me for an examination of his throat, by Dr. Pietrowicz. The nasal cavities showed a thickening of the septum in the left naris. The uvula was thickened and nodular and congested ten per cent. The tonsils were slightly enlarged. The right was ragged in appearance and the nodular condition involved its upper part, and this extended to the anterior pillar. The pharynx, alveolar processes, and buccal mucous membranes were normal. The soft palate showed small, irregular areas of congestion, not raised from the surface. There was no pigmentation. The tip of the epiglottis was a little thickened. The arytenoids were enlarged to about twice their normal size, decidedly nodular in appearance, and not congested or oedematous. The interarytenoideus presented the same nodular aspect. At this time he had very little interference with his breathing. He was under treatment in the hospital for two months and then went home.

He returned to the hospital May 3rd, 1906, after an absence of two years. His father died one year ago of cerebral haemorrhage. The lesions on the skin remain as they were at his first residence, and he has continued in about the same condition as to general health, and has been regularly employed on a milk wagon. There has been a gradually increasing stenosis of the larynx, more obstructive for the past six months, so that he complains particularly of the difficulty in breathing when he catches cold or when the weather changes. Of late the appetite has been very poor and he has lost weight, declining from about 120 pounds to 99. He still drinks large quantities of water and passes an excessive amount of urine. He says that his sexual desire has always been in absolute abeyance. In appearance he is small in frame, poorly nourished, and looks like a boy of fifteen, with fair smooth skin, beardless, although pubic hair has seemed to grow within the last three months. His lesions are now distributed as follows: Linear, light yellowish patches along the margins of the eyelids of both eyes. Very numerous, thickly set lesions around the neck, over the shoulders and in the axillary regions, light brown, discrete, sometimes confluent, thickly set, about 3mm. to 6mm. in diameter, and slightly raised from the surface. There are scattered lesions over the outer surface of the arms to the elbows, and other portions of the body as enumerated in his preceding examination. There is a slightly nodular appearance of the pharynx. The right pillar of the fauces is somewhat contracted at site of an old lesion, as is the tip of the epiglottis. In the larynx

the nodules are so thickly set that the vestibule is almost completely occluded, leaving an irregular opening between the bands and the vocal cords of about three or four millimeters, through which the air passes. The tonsils were operated upon about a year ago.

There are no abnormal conditions shown in the chest or abdominal cavity. Reflexes are normal. The blood shows haemoglobin of 65%, leucocytes 13,000 and red corpuscles 4,000,000. The examination of the urine which was made a number of times showed no albumen or sugar and no sediment. It was amber colored, specific gravity 1002, and the amount in twenty-four hours was 4600 cc.

Tracheotomy was performed at the hospital two days after I showed him to the society, and in one week he had gained about eight pounds in weight, breathed with ease and was improved in general health.

The following pathological report on specimens of tissue in this case have been kindly furnished me by Drs. S. R. Pietrowicz and E. MacD. Stanton.

Gross Description. Specimen consists of two, 2 x 1 cm., pieces of skin removed from the right shoulder and scrotum. The specimen from the shoulder shows several round or oval buff colored areas 2 to 4 mm. in diameter, which project approximately ½ mm. above the surface of the skin. The lesions in the specimen from the scrotum are similar, but larger, measuring from 4 to 7 mm. in diameter and projecting as much as 2 mm. above the surface.

On section are seen immediately beneath the epithelium bright orange-yellow soft areas from 1 to 3 mm. in thickness and corresponding in extent to surface markings. The lesions are apparently confined to the superficial half of the corium, the deeper portions of the corium being depressed at the site of the lesions. The lesions are similar in both specimens of skin but the lesions in the scrotal piece are larger in all diameters.

Microscopic Description. The histologic picture of the lesions is similar in the sections from both specimens except that the changes in the smaller lesions are confined to the papillary layer of the corium while in the larger lesions (scrotum) they apparently extend into the reticular layer. The chief histologic feature is the presence between the connective tissue fibers of the corium of closely packed oval cells with vesicular nuclei and abundant finely granular or vaculated protoplasm, giving the cells a general appearance somewhat resembling adrenal cells. Toward the periphery of the lesions, these cells are definitely seen to lie within lymph spaces

and are apparently of endothelial origin. Scattered throughout the lesions are numerous giant cells containing from ten to thirty or more well formed circularly arranged nuclei and abundant protoplasm similar to that seen in the predominating cells. The native connective tissue is apparently neither increased nor diminished but is relatively decreased in the more cellular areas. At several points a very slight peri-vascular lymphocytic infiltration is seen. Pigment is seen only in a few apparently normal pigment cells lying immediately beneath the stratum Malpighii.

Anatomical and Microscopical Diagnosis. Xanthelasma tuberosum multiplex.

The lesions on the eyelids and about the shoulders are shown very well in the photograph, kindly loaned me by Drs. Hyde and Montgomery, under whose care the patient had been for a number of months previous to his admission to the hospital, two years ago.

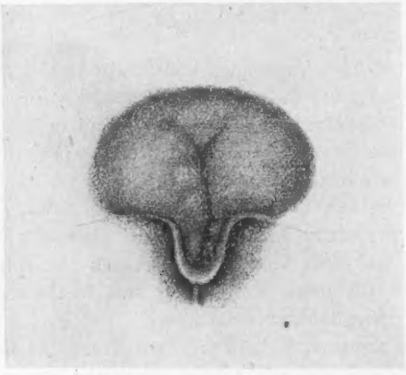


Fig. 2.

The accompanying illustration was very kindly made for me by Dr. J. F. Burkholder, and shows the condition of the larynx at the present time (August, 1906). This has been persistent, and no changes have taken place for many months. The patient is now wearing his tracheotomy tube with comfort. This tube has an oval opening on its upper surface, thus permitting the passage of air through the larynx, so that he is able to speak quite clearly by placing his finger over the outer end of the canula. He is following his vocation as driver of a milk wagon and is in excellent general health.

100 State Street.

REPORT OF TWO CASES OF RADICAL OPERATION ON THE MAXILLARY SINUS AND ETHMOID.*

BY L. R. CULBERTSON, M.D., ZANESVILLE, OHIO.

Case I. March 3, 1905. Miss L. H. referred to me by her family physician, Dr. Rambo, of this city. Has a very large abscess on her cheek which Dr. Rambo lanced a few days before, removing a large amount of pus. Gives a history of tenderness about several teeth and over part of left upper jaw extending over a period of six months. Her dentist had removed the second bicuspid and opened through this into antrum and injected powders and fluids, but with no benefit.

Status Presens. Temp. 100° F. Left side of face greatly swollen and discharging pus, great tenderness all over antrum, malar bone, zygoma, roof of mouth and alveolar process. No tenderness over ethmoid or frontal sinus. Transillumination shows pus in antrum but none in frontal sinus. X-Ray shows pus in antrum. Rhinoscopic examination reveals some pus from ethmoid, none from sinus.

March 4. Under chloroform, operated through canine fossa. Opening large enough for index finger. Found face wall healthy for most part, floor healthy, but roof necrotic, which I curetted freely. Posterior wall being badly necrosed, I removed a large part of it; nasal wall also much necrosed; removed all of it and curetted nasal plate of palate bone, and likewise ethmoidal cells; also curetted face wall and floor of antrum with Coakley curettes. Packed with iodoform gauze.

March 5. Temp. 98.4°.

March 6. Swollen about eye. Irrigated with peroxide and carbolic solution.

March 8. Face swollen, used Crede's ointment.

March 10. Temp. 100°.

March 18. Temp. 99°, considerable discharge from nose and antrum.

March 20. Under ether, made semi-lunar flap from brow to root of nose and entered through lamina papyracea into ethmoid cells which were badly diseased. These were all removed. Sphenoid sinus was entered but found healthy. As the sound showed no pus

* Written for the Eleventh Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, St. Clair, Mich., August 30, 31 and September 1, 1906.

in frontal sinus it was not entered. Small amount of necrotic bone removed from septum; nearly all of nasal process of palate bone removed, nasal side of lamina papyracea curetted, all of orbital plate of the superior maxilla necrosed except a ring about infra-orbital ridge and attachment of inferior oblique. Most of face wall removed with rongeur, also all of posterior wall. Floor considerably necrosed and this was thoroughly curetted. Packed with iodoform gauze.

March 21. Temperature normal.

March 22. Left lid greatly swollen, no diplopia, tear sac normal. Face greatly swollen, painted with 50% icthyol. Removed packing, found no pus and re-packed.

March 25. Temperature normal. Removed dressing, no pus, and wound granulating nicely. Swelling leaving face, no diplopia, tear-sac normal.

March 28. Temperature normal. Bichloride gauze packing, irrigated with carbolic acid sol.

March 31. No dressing in nose. Left hospital today.

April 5. Stop packing. Irrigate daily. All bone covered with healthy granulations.

April 14. Case discharged.

June, 1906. Antrum and nose entirely normal, never had trouble after I discharged her over a year ago. Irrigates cavity every other day. Only lost two teeth. No deformity or diplopia. The germs in this case were pneumococci and a few staphylococci.

Case II. Miss L. L., age 22. Referred by her dentist. Consulted me March 29, 1905, and gives the following history:

Six months ago complained of pain about first molar. Her dentist drilled tooth and treated abscess at its root for several months. Later she consulted Dr. R. S. Conner (dentist) who treated the tooth abscess and told her she had antral abscess and that she should consult a nose specialist, which she did not do for a month. About eight weeks before consulting the writer she had an attack of grip. Nose was stopped up and had much pain in head which lasted several weeks, when all pain and discharge from nose ceased. About this time the abscessed tooth was extracted.

Status Presens. Left cheek swollen and very tender, roof of mouth and alveolar process, nasal process, malar and maxilla up to jaw-joint tender. Nasal examination shows no pus coming from antrum or accessory sinuses. Transillumination doubtful. X-Ray shows dark line along alveolar process. Dr. Conner drilled through socket of second molar and got very offensive pus. Temperature 99 2/5°. Face swollen.

April 3. Operated through canine fossa. Curetted antrum and found small amount of necrosis on posterior wall and about first and second molar. Packed with iodoform gauze.

April 6 to 10. Temperature normal. (Dr. Baron reported the pus contained streptococci in abundance, also staphylococci.)

April 12. Face greatly swollen, so I lanced it to the bone.

April 16. Under ether operated and extended opening in face wall backward and found part of the bone to be double-walled and within the walls a mass of pus. Removed a large part of the face wall, also removed all of the alveolar process from the first bicuspid to the tuberosity. Nasal, orbital and posterior walls apparently not necrosed.

April 19. Temperature 99 2/5°. Packed with gauze.

April 29. Temperature 99 4/5°, considerable offensive pus from antrum and nose.

April 30. Temperature 100°. Entire face (left side) tender, save forehead. Tender over ethmoid, but not tender over frontal sinus.

May 2. Pus very offensive and symptoms more severe.

May 3. Operated under ether. Saw I had to deal with a case of osteomyelitis. Balance of face well diseased. Removed all of it, also part of malar bone which likewise was double-walled and full of pus. All of orbital plate necrosed and was removed. Nasal wall, posterior wall and alveolar process were found thoroughly diseased and were entirely removed, as was also most of the palate process. Found ethmoid badly necrosed. As hemorrhage was great, decided not to lose time in going through lamina papyracea from without, so operated through nose and antrum, curetting all ethmoid cells carefully. Probe showed sphenoid cell normal. Packed with iodoform gauze. Temperature eve of operation 99 3/5°.

May 4. 2 a. m. Temperature 103°. Slightly flighty. 8 a. m. Suffering great pain. Removed dressing and packed lightly. Evening, temperature 101°. Suffering the terrible pain of meningitis. Does not appear to recognize people either by vision or voice. Give chloral by rectum.

May 5. No improvement. Continue chloral. Evening, temperature 103°.

May 6. Give hypodermic of hyoscine. Removed all dressings yesterday and inject in nose frequently 33% argyrol sol. Evening temperature 104°.

May 7. Died at 7 a. m. of meningitis. No post mortem.

SARCOMA OF THE NOSE.

BY R. F. MILLER, SHERMAN, TEXAS.

Warren E., age 17, colored, was sent to me by Drs. Neathery and Ellis of Sherman, Jan. 9, 1906. He had applied to them for treatment of some nasal trouble. The son of healthy, intelligent negro parents living on their own farm, he had grown up under good hygienic conditions. History of the case was as follows: Left nostril had bled frequently and severely for a year. A swelling of the temporal region had begun six months previously. For some months he had been using a catarrh cure from a colored physician, with no benefit. Examination showed a large, firm, sessile granulation mass occluding the left nostril, with several points from which recent hemorrhages had occurred. Posterior examination showed some congestion of the turbinals but the neoplasm could not be seen. The tumor in the temporal region was as large as a hickory nut and had the general appearance of a cyst. There was also a small tumor in the left cheek, which the boy's dentist claimed was due to an obstructed salivary duct. A small portion of the nasal neoplasm was removed for examination. Dr. Ellis reported the growth a sarcoma of round cells and some spindle cells, thus confirming my diagnosis. As usual in his race, the nose was rather flat, it being hard to determine whether the growth had increased the nasal breadth. I was just leaving for New York to spend three weeks, so I gave the patient, as a placebo, a mild ointment of the yellow oxide of mercury to apply three times daily to the tumor. Also I gave him an alkaline spray. He was directed to see Dr. Ellis in my absence should there be any great amount of hemorrhage. My plan was to remove the mass on my return from New York. I saw the patient again on Feb. 5th, almost four weeks after the first visit. He reported the bleeding had been almost none during my absence, but the odor was now very fetid and troubled him most. Examination showed that the neoplasm was beginning to slough. This sloughing continued through February, March and April and was so complete by May 12th, that the whole nasal growth had disappeared. When seen May 27th, there was an absence of all fetid odor, and the inferior turbinal had disappeared almost entirely. A cicatrix covered the stump. The patient was now given potassium iodide 60 gr. daily. He was then breathing well through both

nostrils. Seeing the patient twice in June and once in July with no return of the growth, it began to look as if he would quickly recover. This hope was dispelled on his return Aug. 27th, with a renewed growth from the same stump filling about one-half of the space of the first neoplasm. The fetid odor was again perceptible and indications pointed to another slough. Examination a week later showed a marked decrease in the size of the growth. What the future for the patient will be can not be told. The cyst in the temple continues and he has not consented to its removal. The dentist has not relieved the obstructed duct in the cheek. I shall keep the patient under observation and report further. The few and incomplete reports of nasal sarcoma cases, together with my experience in this case, leads me to believe that many improved cases have been reported as cured.

The Action of Sodium Salicylate and Aspirin on the Ear. HEINRICH HAIKE. *Arch. f. Ohrenheilk.*, Leipzig, Oct., 1904.

A number of animals were killed with poisonous doses of sodium salicylate and of aspirin. The animals died in convulsions. Hemorrhages were found in the middle and internal ear, and changes in the nerve-cells of the cochlea and semi-circular canals were present. Another series of animals were killed before the terminal convulsions had taken place. In these, no hemorrhages were found, but the changes in the nerve cells were present. A third series of animals were poisoned with strychnine, or killed by suffocation. In these animals hemorrhages were present. From these experiments, the author concludes that the hemorrhages reported by other observers in salicylate poisoning were due to the rise of blood pressure caused by the terminal convulsions, and not by the poisonous action of the drug itself.

YANKAUER.

NASAL SARCOMA, WITH REPORT OF A CASE.

BY J. A. WATSON, M.D., MINNEAPOLIS.

In an article* on nasal sarcoma, published in April, 1904, the writer reported four cases of this disease. He has since observed a fifth, the history of which is herewith recorded.

Mrs. H. L., age 44, consulted me in February, 1905. She complained of not being able to breathe through the right nostril. The obstruction had commenced nine years previously, and had slowly but steadily progressed. During the last few years, she often had hemorrhages from that side of the nose, and of late they had been more frequent and more severe. For two or three years past, she had suffered severe and frequent pain in the right side of the nose and face.

The patient had never been in robust health. Her mother died of consumption at forty-five. Her father died at seventy-six, she believed of some growth in the stomach. One sister was operated on at the age of thirty-five for cancer of the breast. These are apparently the only facts in the family history that might have any bearing on the case, all her other near relatives being healthy and long lived.

The patient was fairly well nourished. There was no appearance of cachexia. There was an evident, though not very marked, external deformity, the right side of the nose, including the nasal bone and nasal process of the superior maxillary bone being displaced outward. There was no apparent displacement of the anterior antral wall.

Anterior rhinoscopic examination revealed the presence of a growth filling all the lower part of the nasal fossa anteriorly. It could not be observed in the post nasal mirror. The septum was pushed to the left. The growth was slightly movable, and careful examination with the probe revealed the fact that it had an apparently pedunculated attachment to the septum. It was of firm consistency and dark brownish red color. The growth was easily and completely removed at the first attempt with the cold wire snare and proved to be about the size of an ordinary English walnut. There was practically no bleeding, partly, no doubt, because the growth was severed directly through its narrow pedicle. The

* Sarcoma of the Nasal Passages, et ., *Am. Med.*, April 2, 1904.

patient suffered no inconvenience during or after the operation. There has been no recurrence in eighteen months.

The following is the pathologist's report: "The section is of cartilage in which are found many places where the cartilage has become supplanted by irregular areas containing round cells, between which is seen a variable amount of intracellular tissue. Many places show islands of cartilage isolated by the sarcoma cells. Numerous areas in both sarcomatous and cartilaginous elements show myxomatous degeneration. Diagnosis, Chondro sarcoma." This examination and report were made by Dr. Louis Dunn, of the pathological department of Hamline University.

This case substantiates the opinion expressed by the writer in his former article, that, contrary to the opinion of certain eminent authorities intranasal operation is justifiable in many, if not in most cases, of sarcoma of the nasal passages. He believes, in short, that intranasal operation is indicated in nearly all cases where the growth has an apparently limited area of attachment, and is manifestly confined to the nasal passages proper, without involvement of the sinuses. At an early stage of their growth most cases conform to this description. Nevertheless, the statement is not that all, but that nearly all such cases may properly be operated upon intranasally, since there is no doubt but that a case may exhibit such evidences of malignancy as to well "give us pause". I am inclined to the opinion, however, that in such rare instances, for it will be remembered that excessive malignancy is rare in the case of nasal sarcoma, the dilemma is not so much whether we shall operate intranasally or extranasally, but rather whether we shall operate intranasally or at all.

On the other hand, I believe that involvment of the antrum of Highmore is not always an absolute contraindication to intranasal operation. Provided it can be established with a fair degree of probability that the other sinuses are not involved and that the involvement of the antrum is really secondary, as indeed it usually is, we are justified in operating tentatively, since we will probably find that the antral walls are not involved, and that the growth, being merely a prolongation of that in the nasal fossa, can be pulled away *en masse*. *Case 2* of the series reported in my original article was a typical one of this variety, and was cured by intranasal operation. In advanced cases of this kind, access to the antrum is usually easy for the reason that the partition separating the two cavities is likely to have largely disappeared by pressure necrosis. But even should the operation reveal the fact that the growth is more than a

mere prolongation, and that the walls of this cavity are actually involved in the pathologic process, there is no greater difficulty in removing the superior maxilla than before the intranasal operation was undertaken. The surgeon who has been wise enough to previously inform his patient as to the possibilities of the situation has not in any way compromised his reputation.

The classical symptoms of nasal sarcoma were manifested in the usual order in this case, viz: nasal obstruction, hemorrhage, pain, deformity, an order of occurrence which, as pointed out in my original article, is not without some suggestive bearing on the question of the site of origin and the progress of these growths. An inquiry into the probability of this growth having been originally pure chondroma would be perhaps interesting, but fruitless. The author still believes in the possibility of such transformation.

1034 Andrus Building.

Tubercular Laryngitis. A Plea for Early Recognition and Treatment. L. C. CLINE, *Medical Age*, December, 1905.

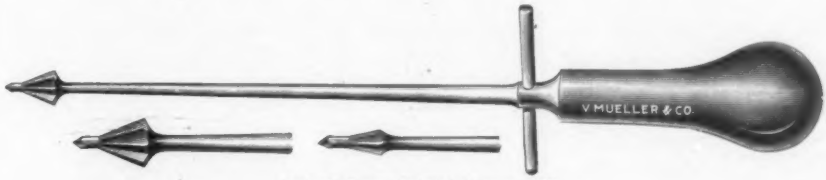
Primary infection is an acceptable fact to the author. This occurs through the lymph channels from the pharyngeal, fancial or lingual tonsils, or from some other part of the upper respiratory or digestive tract. The larynx is the most frequent site of involvement. Chronic catarrhal laryngitis, with general impaired vitality, furnishes the most favorable conditions for the infection. Every country in the state should convert some of their beautiful hill lands into sanatoriums and equip them with every comfort and attraction. Those infected need to be educated at schools as to how the disease is contracted and how to get rid of it.

STEIN.

A TROCAR-POINTED ANTRUM DRILL.

BY HENRY R. BOETTCHER, M.D., CHICAGO.

Most patients object to the radical operation for empyema of the antrum of Highmore, where a general anesthetic is required, but will submit to an operation that can be done within the nose under a local anesthetic. The instrument now most used is the trephine with a dental engine or electric motor. The trephine obstructs the view; the instrument is not under absolute control of the operator, and there is an element of danger associated with a rapidly rotating trephine within the nasal cavity, especially with a nervous patient. Then, too, there is the added expense of the engine.



Author's Trocar-Pointed Antrum Drill.

Eight months ago I had made a drill, the body of which is cone-shaped, to which I have added a series of sharp cutting leaves set at an oblique angle, a very sharp trocar point, and a substantial handle, while the heel is beveled off to make its retraction from the antrum easy. With this instrument, I can rapidly and easily bore through any part of the outer walls of the nasal passage into the antrum in less than one minute, with little or no pain to the patient, leaving an opening one-quarter inch in diameter, with a smooth edge.

The instrument is made in two sizes. The small drill is one-eighth inch in diameter, and has a very sharp trocar point. This is used for diagnosis and to make an opening which acts as a guide for the larger drill. The larger drill is one-fourth inch in diameter, and has a point which may be sharp or blunt.

METHOD OF USE.

1. A 10 per cent. solution of cocaine is applied to the inferior turbinate and outer nasal wall. This is followed by an application

of a 1-1000 solution of adnephrin. These applications are to be repeated in five minutes. Another interval of five minutes is allowed before beginning the operation.

2. The anterior third of the inferior turbinate is removed, first, by incising with scissors through its anterior attachment, and then the nasal snare is used to remove the incised portion.

3. The small drill with the sharp trocar point is now set well forward and low on the outer wall of the inferior meatus, but not anterior to the attachment of the inferior turbinate, and driven into the bone by a tap or two of a mallet. This sarts it and prevents slipping along the bone, which sometimes happens when started by hand. Then, too, the drill can be made to go in at a more acute angle by this method. Now, by a rotary motion, the drill is easily made to cut its way into the antrum.

4. The large drill with the dull point is now used to enlarge the opening. Great force is not necessary and should not be used. The dull point of the large drill simply acts as a guide, and cannot do any harm to the opposite wall of the antrum should one suddenly break into the cavity. A second opening may be made directly above the first one.

5. A bone-cutting forceps of the Myles or Gruenwald type is now used to enlarge the opening to meet the requirements of the operator, and in this manner a great part of the inner wall of the antrum can be removed.

Where a trocar has been used as a means of diagnosis, the use of the small drill may be dispensed with and the point of the large drill may at once be inserted into the opening.

One opening is usually sufficient to allow the bone-cutting forceps to enter. The lower ridge of the opening may be removed with a gouge, if necessary. As there is always a tendency for a small opening to close up, it is well to remove a good part of the inner wall of the antrum.

After-Treatment. The patient is given a canula, shown how to attach it to a fountain syringe, and how to irrigate the cavity with a 1-1000 solution of permanganate of potassium. With this the cavity is irrigated twice a day and the patient reports at the office every other day for treatment.

34 Washington St.

THE MAXILLARY SINUS OPERATION THAT HAS YIELDED ME THE BEST RESULTS.

BY CHEVALIER JACKSON, M.D., PITTSBURG, PA.

It is unnecessary to review the voluminous literature of maxillary sinus operations. It is well known to the rhinologists of today. The operation which has yielded me the largest percentage of cures is briefly described as follows:

The anterior two-thirds or all of the middle turbinal is removed. Then the entire inferior turbinal is removed except a long ridge-like stump. The next step is the enlargement of the normal antral opening all the way down to the floor of the nose. This opening must be of ample size, so that it will remain open for a long time, if not permanently, and must extend to the floor of the nose to afford proper drainage of the antrum. On this depends the success of the operation. Care should be taken to keep back of the nasal duct. If possible, it is better to avoid wounding it.

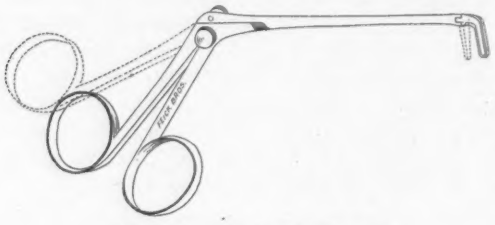
The naso-antral wall must be removed backward to the posterior limit of the antral cavity so as to afford perfect drainage without a "pocket" in dorsal decubitus. It is the constant contact of pus that perpetuates degenerative changes in the lining of the walls of the antrum. With this opening a backward inclination of the head, as is natural in screatus, permits complete emptying of the antrum.

The next step is the removal of sufficient of the anterior wall of the antrum by the buccal route to enable the exploration of the cavity with the finger and the thorough removal of diseased tissue. Normal ciliated epithelium must be spared, if present, but no diseased tissue should be allowed to remain.

The cavity is irrigated with boric acid every alternate day, and repacked through the buccal wound. Iodoform gauze, thoroughly rinsed in weak bichloride solution to remove the excess of iodoform, is used for the cavity, but plain gauze is knotted to the end so that what lies in the mouth will contain no iodoform. When the cavity is seen to be lined with healthy granulations, or in some cases not until it is epithelialized, the buccal wound is allowed to come together or is stitched, after packing the antral cavity with iodoform gauze, omitting the plain gauze, knot and plug. This last packing is removed through the nose on the third day. In some cases

irrigation through the nose may have to be carried out for a time; in other cases it will not be required.

Those who object to the removal of the inferior turbinal may often get very good results by modifying this operation to the extent of biting off only the posterior end of the inferior turbinal with Hartman's conchotome. The amputation of the inferior turbinal is a gain, not a loss, to the individual living in Pittsburg, whatever it may be elsewhere. Most cases renew a functionally sufficient inferior turbinal in a few months, and after a year no observer on looking into the nose could tell that a radical turbinotomy had been done.



Author's Naso-Antral Biting Forceps.

For making the naso-antral opening the instrument shown in the cut ensures rapidity. This part of the work some operators will prefer to do under local anaesthesia, and in the erect posture. Usually the patient's preference, like my own, is for the completion of the work at one operation, under general anesthesia, preferably with nitrous-oxid and ether, and of course, in the recumbent position.

For acute sinuitis, unaccompanied by degenerative change in the mucosa, the intra-nasal steps of this operation are all that are necessary. A cure has followed in eight successive cases.

I have been doing this operation for a number of years, but only recently have I had so convenient an instrument with which to do it.

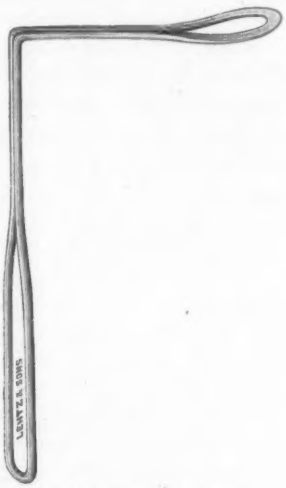
The jaw opens laterally, not antero-posteriorly.

Fifth Ave. and Smithfield St.

A PRACTICAL TONGUE DEPRESSOR.

BY W. W. BULETTE, M.D., PUEBLO, COLO.

As the tongue depressor is an important instrument in the armamentarium of every Rhinologist, it seems strange that so few are made correctly. In the examination of a patient, first impressions are generally lasting, so that it is extremely important, that at least the first examination be made with care, and that the tongue be



Author's Tongue Depressor.

firmly, yet gently depressed, and that no gagging should ever occur. With the use of the tongue depressors in common use, it is almost impossible to make a thorough examination without gagging, and the trouble is, that the distal end turns *down*, and presses too firmly on the base of the tongue and over the seat of the most sensitive nerve area, while if the distal end turns *up*, even more firm pressure can be made on the portion of the tongue that actually needs depressing, to obtain full view of the contiguous parts, and retching and gagging are absolutely prevented.

My attention was first directed to this matter while using a common table spoon in examining patients at their homes, not having a tongue depressor at hand. I invariably turn the spoon upside down so that the distal end of the handle, while depressing the tongue, is turned up. I noticed that my patients never gagged, nor retched, and the examination was always more satisfactory, and particularly is this true of children. Following this idea, I had Messrs. Chas. Lentz and Sons, of Philadelphia, make me a tongue depressor with the distal end turned *up*, as illustrated in accompanying cut, and after using this form of tongue depressor for the past seven years, I wish to offer it to my professional brethren, in the hope that it may contribute to their satisfaction as much as it has to mine. I recently had Mr. H. Pfau, of Berlin, Germany, make the instrument also, after Lentz pattern.

The instrument is made of German silver wire, nickel plated, joined and soldered at end of handle. The distal end is flattened (as shown in illustration) and edges are well rounded. It is light durable and not expensive, so that one can have a couple of dozen, and throw into the sterilizer after use.

Physician's Building.

Foreigh Body in the Larynx. C. HŒDLMOSER. *Wien. klin. Wchnschr.*, March 27, 1905.

A boy 8 years old inhaled a triangular piece of bone, measuring 17 cm., which lodged in the rima glottidis. Dyspnoea set in, but did not become severe until nearly a week had elapsed. The bone was then removed through the mouth, without an anaesthetic, not even cocaine being used.

YANKAUER.

SELECTED ABSTRACTS.

Case of Empyema in the Posterior Ethmoidal Labyrinth with Paralysis of the Conjugate Movements of the Eyes and Bitemporal Limitation of the Visual Fields. W. GLEGG. *Lancet*, September 30, 1905, p. 947.

Female, aged 19, attributed disturbances of vision to influenza. At first she could not see objects with accustomed clearness; then she had pain at the back of the right eye and persistent headache. Afterwards she had to turn her eyes to the right side in order to see things on that side, and she noticed some difficulty in seeing objects on the left side.

On Jan. 20th, the following conditions were found on examination: R.V. 6/12; L.V. 6/18. The correction of a hypermetropia of +0.50 D. sph. did not improve the vision. It may be added here that according to a note of a previous visit to the hospital in 1899, vision was then 6/6, with +1.5 D. sph., in both eyes. The visual fields for white were tested and the right one was found to be limited on the temporal side by about 50°. The left one was also contracted on the temporal side but only to the extent of about 30° (see Figs. 1 and 2). As regards the ocular movements, when the patient attempted to look to the right neither the right nor the left eye could be moved beyond the middle line. The excursion of the eyes to the left was complete but at the extreme limit a horizontal, slow, nystagmoid movement appeared in both eyes. The upward and downward movements were normal. There was no diplopia. Light and accomodation reflexes were normal. The pupils were of equal size. The fundus of each eye presented a normal appearance. There was no sign of neuritis. The patellar reflexes were brisk. When the eyes were closed, the patient swayed slightly but scarcely sufficiently to be considered pathological.

Examination pointed to pus in the posterior ethmoidal cells on the right side, and they were opened under ethyl chloride. Only about a drop of pus was evacuated. No pus at the sphenoidal ostium.

On the next day the patient was able to see more on the right side and did not require to turn her head as much as before. The pain in the head had subsided and she remarked that her eyes felt

better. Some purulent secretion was seen flowing from the site of operation into the middle meatus. On Feb. 21st, the left field of vision appeared to be normal and the right was nearly so; there was only a deficiency of 10°. The right vision was 6/8 and the left was 6/8 partly. The fundus showed nothing pathological in either eye as before. The eyes could be moved to the right for some distance beyond the middle line but not yet completely. Nystagmoid movements supervened in both eyes when looking to the extreme left, but only in the left eye when looking to the right. There was no diplopia.

On March 27th, vision was 6/6 partly in both eyes. This was not improved by correction. Both eyes could be turned completely to the right. Nystagmoid movements were present in both eyes at both extremes of lateral motion. The fundus, fields, light and accommodation reflexes were all normal. The patellar reflexes were brisk. The crusting had disappeared from the site of operation and there was no trace of pus on the roof of the right posterior choana of the nose. On May 19th, the vision in each eye was 6/6 partly, with +0.25=6/6. Slight nystagmoid movements were still present at both extremes of lateral excursion in either eye; otherwise the condition of the patient was the same as on March 27th.

As regards the etiology and pathology of the case it is quite possible, in fact probable, that the defective vision and the contracted fields were due to inflammation spreading from the mucoperiosteum of the posterior ethmoidal labyrinth to the optic chiasma. It is much more difficult to account for the paralysis of associated movements. The difficulty is increased by the fact that the explanation must not only account for the paralysis to the right but also the paresis to the left. If the former had been present alone one might have accepted a lesion of the right sixth nucleus as a possible coincidence but to assume a lesion of both sixth nuclei would seem rather unsatisfactory even as a coincidence. In the present state of our knowledge, however, it does not appear possible to solve the problem correctly. One fact merits special attention. The right field of vision corresponding to the right association paralysis was more impaired than the left field and there was only a paresis of the left association movements corresponding to the left field of vision. This would tend to show: (1) that the lesions of the fields and the ocular movements bear some relation to each other; and (2) that if the empyema produced the former it was the probable cause of the latter also. Thus our considerations bring us back again to the optic chiasma and here there is not much choice in placing the

lesion; the commissure of Gudden is the only position in which a lesion might account for the affection of the associated movements. Unfortunately, we possess at present no precise information regarding the functions of this commissure.

ST. CLAIR THOMSON.

A Consideration of Septal Spurs and Deflections—HARMON SMITH, (New York.)—*Internat. Journ. Surg.*, Dec., 1904.

Smith holds that it is apparent to any careful observer connected with a large clinic that many spurs have been removed unreservedly and without benefit to the patient. More than this, he feels warranted in affirming that absolute harm has been done by creating a dry "scabby" condition of the septum, "which is a constant source of irritation to the patient." Few if any of the Asch operations result in a perfectly smooth outline of septal surface.

He has known of many cases where for months it was supposed a proper correction had been made, when a year or more afterward the patient has returned, and the deflection found as marked as originally.

He maintains that the many modifications of the method of correcting deflections have the same undesirable sequels as the Asch operation, excepting that of removal of the cartilage.

Following the first experiences of the specialist, each year deducts from the number of spur operations he performs, and adds to his caution in their operative treatment. He inquires particularly into how much obstruction the spur occasions, how much of the catarrhal condition is due to it, and how much of the existing tinnitus is due to it.

Another point is the location. Spurs well posterior obstruct but little unless close to the floor of the fossa; also, where they are on the upper two-thirds of the septum either anteriorly or posteriorly.

Russell advises always, in the case of low situated spurs an *attempt* to save the mucous membrane covering them. Attempts, because in so many instances this is all our efforts amount to. He has devised a small instrument for the purpose of cutting the mucous membrane prior to uplifting the flap. It consists of a circular disc knife revolving on a small axle, the outer part of the blade being protected by a jacket. After lifting the flap, an elevator is used, and then chisel or saw to remove the spur.

He advocates, in deflection, the removal of all the cartilage involved in the deflection by careful dissection. Should there be any

good reason for not employing this tedious method, he advises the correction under cocaine, by making a number of small incisions through the mucosa and cartilage on the convex side, to the mucosa of the opposite side, and pushing one strip into place at a time, only making perpendicular cuts when a piece can not be put into line without it. The parts should be pushed well over to the opposite side, thus allowing for any tendency to resumption of the original position, and then held there by a hollow splint of sufficient size to maintain this over deflection. The splint should be worn for from four to six weeks. In this manner, he has had a fair number of good results, and believes it a better and safer method than the Asch, and attended by far less shock to the patient.

In closing he reiterates his opening point as of chief importance: "That it requires better judgment to decide when not to operate on spurs and deflections, than it does to determine when to operate, even though one possesses the ability to perform a so-called brilliant operation." EATON.

Some Observations in Ozæna. A. BETTI. *Rev. Hebd. de Laryngol, etc.*, November 12, 1904.

The author reports several methods of treatment which are of interest. He has treated two cases of ozaena with the antidiphtheritic serum without result. He has also treated five cases by the application of protargol (1/100) by means of tampons of cotton placed within the nostrils for five minutes, after having irrigated the nostrils with a saline solution. The result of this method was not appreciable.

He has obtained excellent results, however, by means of the following preparation:

Metallic iodine	20 centigrammes
Iodide of potash	40 centigrammes
Glycerine	35 grammes

The nostrils are first washed with a warm solution of permanganate of potash (¼, 000), afterwards a tampon of cotton saturated with the above solution is inserted, and left ten or fifteen minutes. The results were excellent, and even in those cases which had been treated ineffectually by the other methods. After apparent cure, the treatment should be continued every second day, and afterwards twice weekly.

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